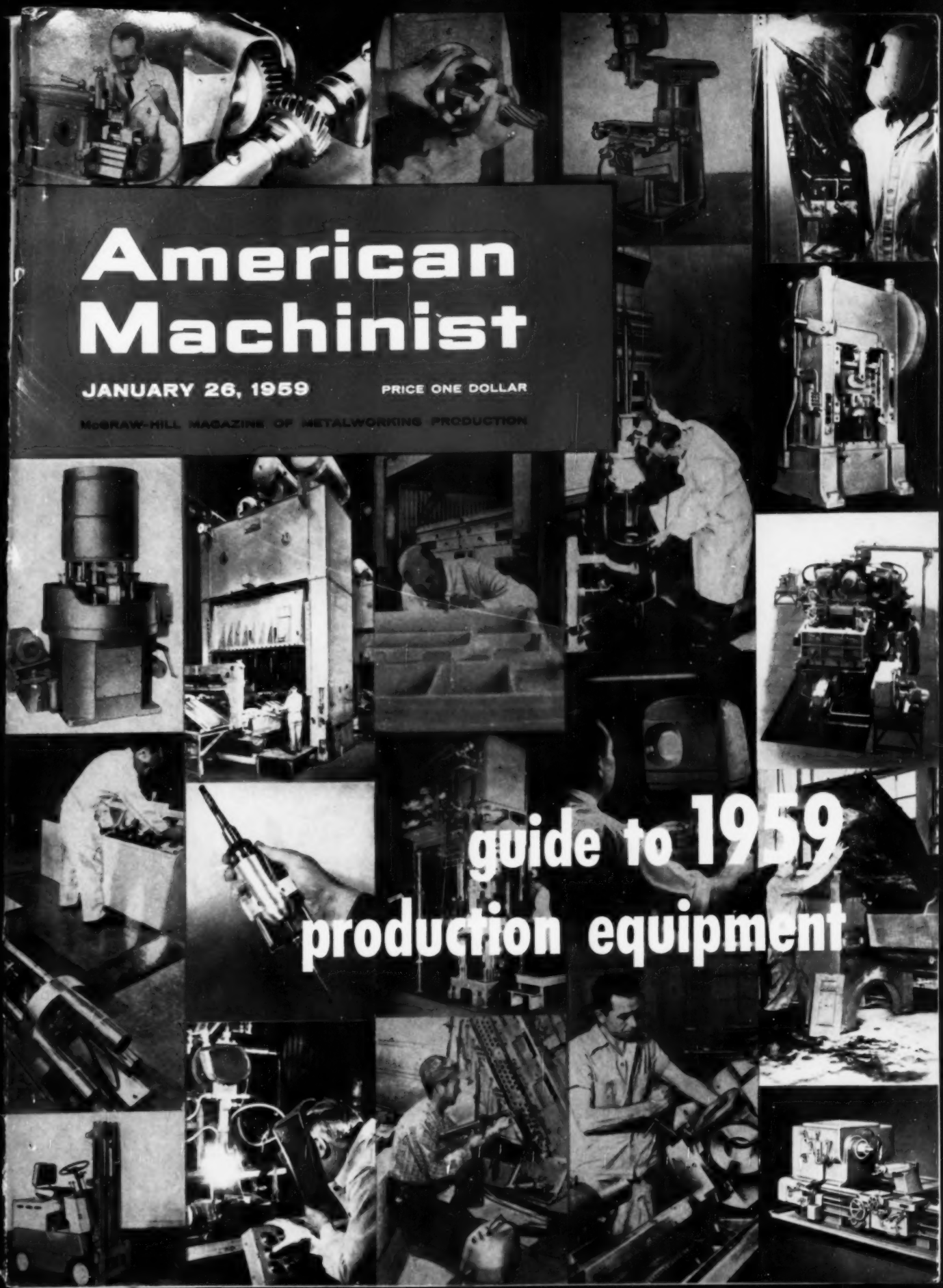
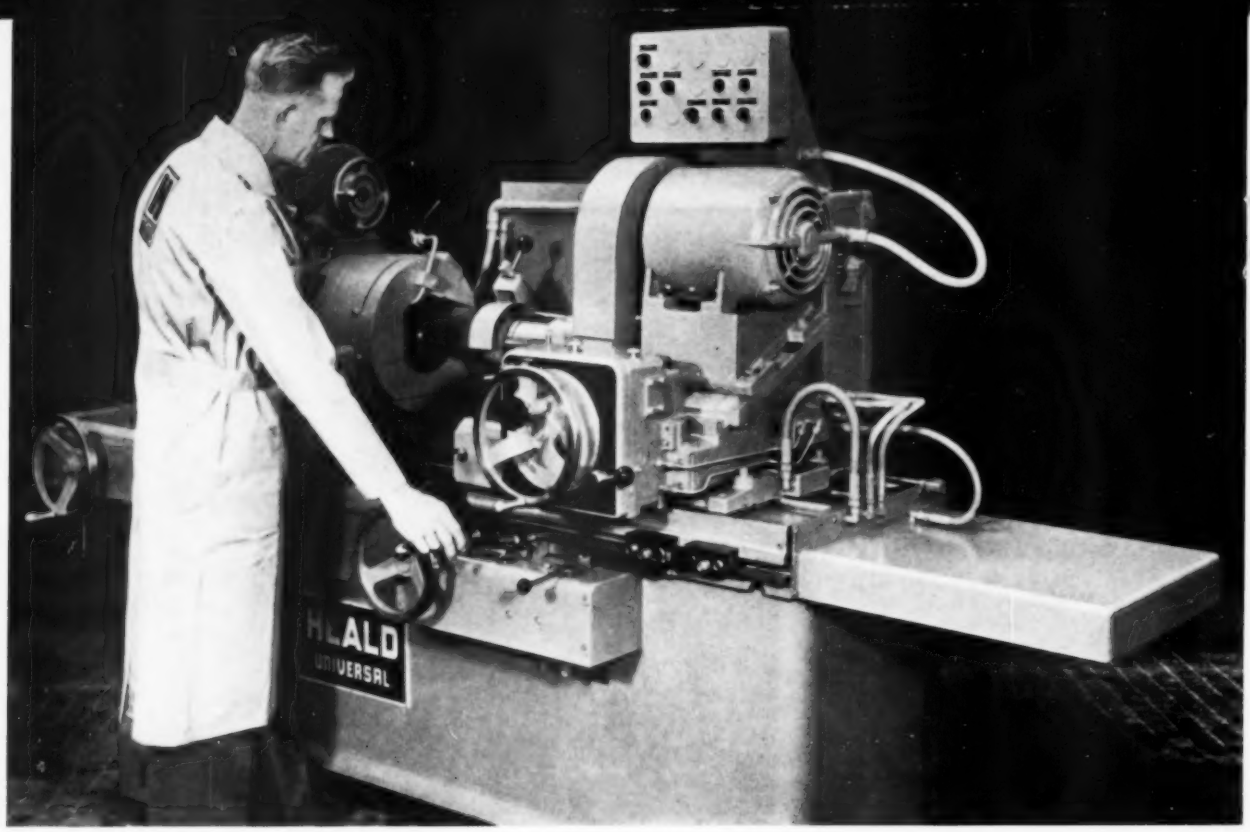

American Machinist
JANUARY 26, 1959
PRICE ONE DOLLAR
McGRAW-HILL MAGAZINE OF METALWORKING PRODUCTION
guide to 1959 production equipment



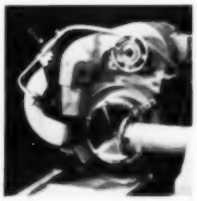
Presenting the Heald Model 273-A

NEW UNIVERSAL

a completely new machine with

1959 PERFORMANCE

and a 1947 PRICE TAG



. . . for I. D., O. D. and Rotary Surface Grinding

THIS is the machine that "couldn't be built" — a better, more *versatile* general purpose grinder that costs about *half* as much as comparable machines today, and *less* than similar machines (with fewer features) cost in 1947!

Here are just a few of its outstanding features:

Hydraulic Anti-Friction Ways – table and cross slide are supported on "pockets" of pressurized oil. A quarter-pound force moves the 1800-pound table.

20-Inch Table Travel – more than in any previous standard base Heald universal grinder.

Workhead Swivels 90 Degrees – permitting rotary surface grinding as well as I.D. and O.D. grinding.

Three Wheelhead Positions – standard, 2" forward or 7½" forward for greater grinding versatility.

Vari-speed Workhead Drive – infinitely variable from 150 to 450 rpm.

Swing Inside Standard Guard – 12".

Standard O.D. Grinding Capacity – 12".

Accuracy – holds tolerances within .0001" in routine production and within .000050" in special cases.

Ask your Heald engineer for the complete UNIVERSAL story. Then compare its performance and cost with *any other machine* available today. And if you have a Heald toolroom grinder that's 10 to 30 years old, you can now replace it profitably – at a cost that's *too low* to pass up.

HEALD

It PAYS to come to Heald

THE HEALD MACHINE COMPANY

Subsidiary of The Cincinnati Milling Machine Co.

Worcester 6, Massachusetts

Chicago • Cleveland • Dayton • Detroit • Indianapolis • New York

American Machinist
McGRAW-HILL PUBLICATION IN METALWORKING PRODUCTION

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VOLUME 103, No. 2

1959 PRODUCTION PREVIEW

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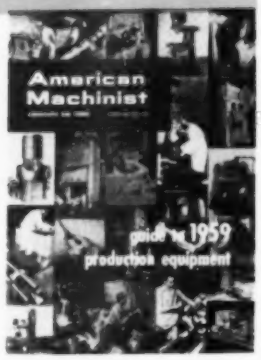
American Machinist chips



Cover . . .
A montage suggesting the broad range of equipment covered in this Production Preview Issue.

Equipment Preview . . . This is our 46th Annual guide to new production equipment. Here you will find in capsule form all the items of new equipment described in the pages of AMERICAN MACHINIST during 1958. Original items were written by Jack Dwyer, Ann McTague, and other staff members. Jack has condensed them for you and prepared this classified summary, starting on page 101.

Exciting Obituary . . . The rest of this contains, for us, a mixture of sad and exciting news. This is the last time this column will appear in AMERICAN MACHINIST. After this week, you will find, starting here and continuing on the following pages, a summary of significant developments in tooling, processes, and materials of importance to you as a production man. This *will not* be an abstract of the issue. It *will* be an exciting new kind of technical journalism tailored to fit the needs of today's harried but fact-hungry reader.

We like Chips. It has been a pleasure to write it for several years now. But our improvements in the contents page have gradually taken over the function of Chips and with the next issue will completely absorb it.

Why we are different. AMERICAN MACHINIST has always been different from other magazines in its field. It has prided itself on the depth of its coverage and the speed with which it recognized the significance of new developments. It has pioneered in many editorial concepts; In the declaration of independence from the advertiser and devotion to the interest of the reader. In the banishing of advertising from the front cover. In the use first of color covers, and then of color covers that reported news. In the recognition that a new process is as much "news" as a new tax law or a new car design.

It has long been the practice of technical magazines to put so-called "feature" technical stories in one part of the book and "news" into another. AMERICAN MACHINIST has abolished this artificial barrier and the two are intermingled as they should be, because both constitute news of latest developments in metalworking production—news in depth.

We now take the next logical step. It seems logical now, but it has been nearly two years in development. We have studied your needs and your wishes, we have had to deal with production problems and contractual relationships. Clearing space at the front of this magazine took on some of the aspects of assembling parcels and clearing land for a new building in the center of town. Coming, February 9, starting on this page, is Metalworking Report—significant, current developments in tooling, materials, and metalworking processes.

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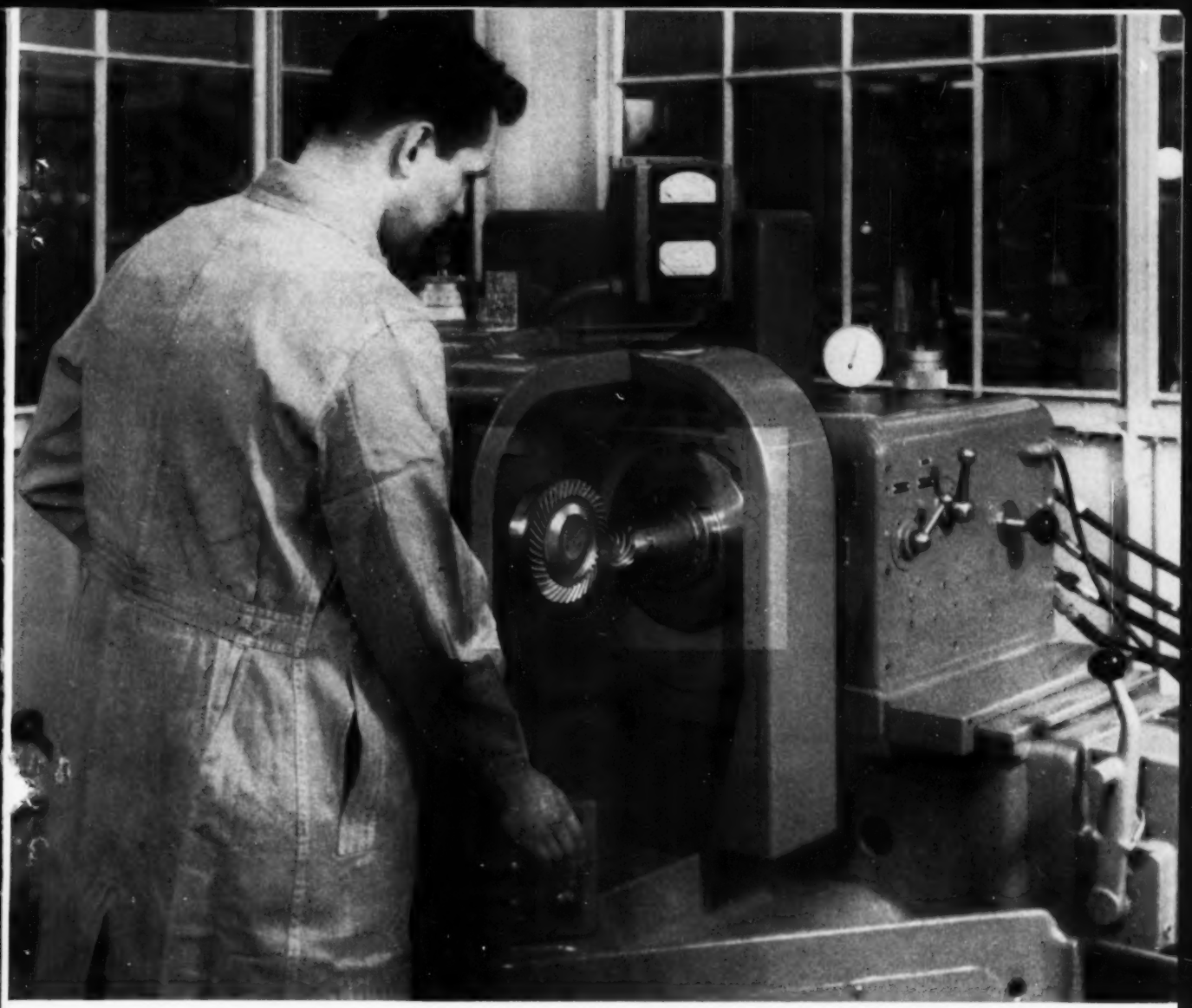


Now you can *speed-test* gears up to 4000 RPM

Since the accuracy of any gear test depends on how well it simulates actual operating conditions, we've developed a hypoid tester with speeds up to 4000 RPM. The higher range of speed on the No. 17A-4000 Hypoid Tester makes possible a new standard in the testing of bevel gears.

Complete testing on one machine. The No. 17A-4000 Hypoid Tester is arranged for both power and slow rolling tests. With the power test you can observe a gear's smoothness of operation, its noise characteristics, and its tooth contact pattern.

Roll test the gear and you get accurate readings of its eccentricity, tooth size, spacing, and profile.

With the No. 17A-4000 Tester you can test any right angle straight bevel, Zerol® bevel, spiral bevel and hypoid gear of any pitch and up to 20" OD.

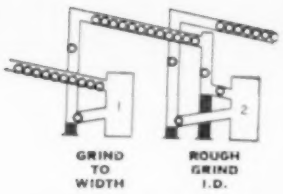
Pre-set backlash control. The No. 17A-4000 Tester has a new hydraulic backlash control mechanism. The control automatically duplicates your pre-set backlash value when you change the relative positions of a gear pair to simulate actual operation.

Exact duplication of settings. Indicator set-up fixtures are available for large quantity testing. With these gages you can make identical settings on a battery of machines, or get the same setting repeatedly on a single machine.

New bulletin. We've prepared a bulletin on the No. 17A-4000 Hypoid Tester to answer any questions you might have about its construction or operation. Write for a copy.

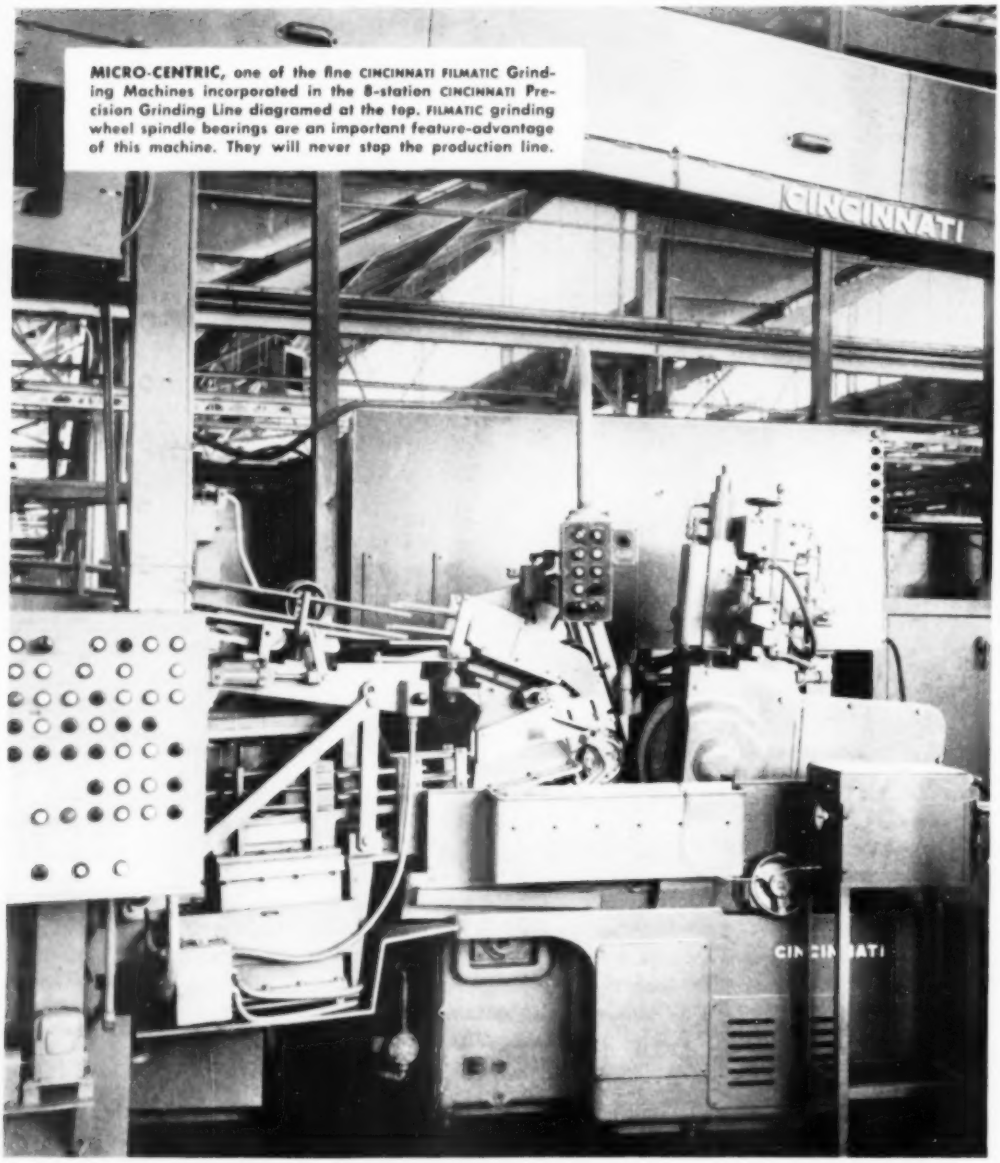
GLEASON WORKS
1000 UNIVERSITY AVE., ROCHESTER 3, N.Y.

CIRCLE 101 READER SERVICE CARD



FILMATIC

CINCINNATI Builds



MICRO-CENTRIC, one of the fine CINCINNATI FILMATIC Grinding Machines incorporated in the 8-station CINCINNATI Precision Grinding Line diagramed at the top. FILMATIC grinding wheel spindle bearings are an important feature-advantage of this machine. They will never stop the production line.

CINCINNATI®

CENTERTYPE GRINDING MACHINES • CENTERLESS
MICRO-CENTRIC GRINDING MACHINES • CHUCKING

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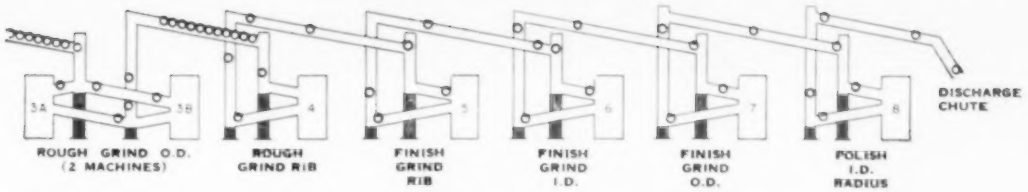

Precision Grinding Lines...

to keep your costs in line

Machine tools and production lines built by Cincinnati incorporate a most necessary ingredient... lower manufacturing cost for the purchaser of the equipment. The CINCINNATI precision Grinding Line diagramed above illustrates the point. It is an independent unit system, developed by Cincinnai automation specialists. Each unit constitutes an individual and complete machine, which can be replaced whenever conditions change. Although there are machines of other makes in this line, Cincinnati takes complete responsibility for everything: the machines, tooling, conveyors, electrical equipment, quality and production. ¶ Parts rolling off this line are anti-friction bearing cones. They conform to the highest standards of precision bearing manufacture. In all, there are seven grinding operations and one polishing operation. Grinding stations incorporate Cincinnati Automatic Sizing with feedback controls and automatic washing and demagnetizing of the parts. A banking arrangement for the first three machines takes care of unforeseen difficulties. The automatic handling equipment accommodates five sizes of bearing cones covering a diameter range of 2 to 1. It requires no adjustment whatever in changing from one size to another. ¶ Cincinnati's large forward-thinking engineering staff and extensive manufacturing facilities are tops for developing and building production lines of this type. We invite your inquiries on precision cylindrical grinding equipment of any size ranging from versatile toolroom grinders to completely automatic precision grinding lines.

Anti-friction bearing cone, a high-quality, high-volume component produced at rock-bottom cost on the CINCINNATI engineered and built Precision Grinding Line described here.

CINCINNATI

GRINDING MACHINES • ROLL GRINDING MACHINES
GRINDERS • CENTERLESS LAPPING MACHINES

GRINDING MACHINE DIVISION
The Cincinnati Milling Machine Co.
Cincinnati 9, Ohio

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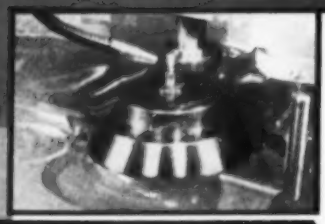
FELLOWS GEAR



CUTTING

GEAR
external and internal

	3" FINE-PITCH	NO. 4GS	7-TYPE	7A-TYPE
Max. Pitch Diameter	3" ext., 2" int.	6"	7" spur*, 6-1/2" hel.	7"
Max. Diametral Pitch	40 steel, 30 brass	5/7 spur, 6 hel.	6 spur, 6/8 hel.	5/7 spur, 6 hel.
Max. Face Width	3/4"	2"	1-1/2" ext., 1" int.	2" ext., 1-1/2" int.
Max. Strokes Per Min.	2000	635	450	450

*Max. P.D. internal—3-1/2"

FINISHING

SHAVING MACHINES
spur and helical gears

	NO. 4 FINE-PITCH	NO. 8 "FULL-TOOL"	NO. 11 INTERNAL	GEAR GRINDER
External & Internal	ext. only	yes	int. only	NO. 12 FELLOWS REISHAUER
Max. Pitch Diameter	4"	8"	***	Spur and helical, max. O.D. 12". Max. face width, spur, 6-3/4"; helical: depends on pitch and helix angle. Pressure angles: 14-1/2° to 30°. Pitch ranges: 6 to 48 D.P. or 20 to 120 D.P.
Max. Diametral Pitch	20	4	6	
Max. Face Width	1"	2-1/2"	1-1/2" up to 10P; 1" 12 to 16P	
Max. Spread of Centers	12"	**	***	

*Also 12", 18" and 24" machines for externals only. **Depends upon work-holding fixture. ***Depends upon design of gear.

INSPECTION

COMPOSITE CHECK
external and internal spur and helical gears.

	No. 4 Fine-Pitch RED LINER	No. 8M RED LINER	No. 20M RED LINER	INVOLUTE PROFILE CHECK	LEAD, CROWN & TAPER CHECK
Max. Pitch Diameter	4"	***	18"	12"	12"

Nos. 24M Involute and 24H Lead Measuring Instruments available with capacity of 24 inches. ***Depends upon design of gear

CIRCLE 104 READER SERVICE CARD

PRODUCTION EQUIPMENT

SHAPERS
spur and helical gears

6A-TYPE	No. 12	36-TYPE	120-INCH
18″	12″	36″	120″
3/4 spur, 5/7 hel.	3/4 spur, 5/7 hel.	3 spur, 4/5 hel.	2 spur, 4 hel.
5″ ext., 3″ int.	4″	6″	8″
300	550	300	148

GEAR HOBBER

NO. 12GH2 HELIGUIDE

Spur and helical, max. O.D. 12″. Max. face width, spur, 6″; helical, depends on helix angle and diameter. Max. diametral pitch 4. Hob speeds 123 to 430 R.P.M.

Also available: No. 10 Rotary Gear Shaper—10-spindle machine for very high production rates. Max. P.D. 12″. Max. D.P. 3/4 spur, 5/7 helical. Max. face width 3″. Max. cutting speed 300 strokes per minute.

FELLOWS injection molding equipment

Fellows Plastics Injection Molding Presses are the fastest fully-automatic machines in their capacity ranges. Sensitive, accurate, built-in controls assure fast, reject-free production with minimum operator attention.

	Model 3-125	Model 6-200	Model 12-350
Capacity	3 to 4-1/2 oz.	6 to 9 oz.	12 to 20 oz.
Pounds per hour	45	75	150
Cycles per hr. (dry run)	600 to 840	490 to 650	600 to 800
Max. mold size	12″ x 17″	15″ x 21″	20″ x 33″

No. 4 FELLOWS COLD-FORMING MACHINE

Cold-works metal, ferrous or non-ferrous, to desired shape by kneading or plasticizing at room temperature. External shape is tubular, internal shape is determined by a mandrel. Maximum diameter of finished work: up to 4″ O.D., depending on wall thickness. Maximum length of finished work: 20′.

Fellows also builds special-purpose machines for production of gears and other related items. Descriptive literature, technical data and price information on all types of equipment shown is available on request. Contact any Fellows office.

THE FELLOWS GEAR SHAPER COMPANY
78 River Street, Springfield, Vermont
Branch Offices: 1048 North Woodward Ave., Royal Oak, Mich.
150 West Pleasant Ave., Maywood, N. J.
5835 West North Avenue, Chicago 39
6214 West Manchester Ave., Los Angeles 45

THE PRECISION LINE

Fellows Gear Production Equipment

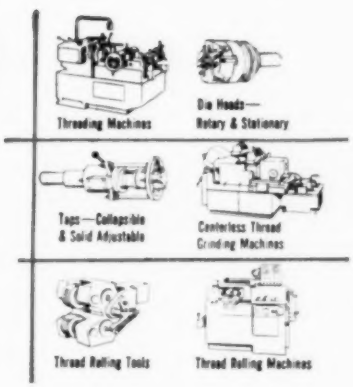
CIRCLE 105 READER SERVICE CARD

THREADING *at 581 r. p. m.*

Suburban Industries, Bensenville, Illinois, is achieving these results with a compactly-designed LANDMACO 5C Threading Machine equipped with a 5/8" VVV LANCO Hardened and Ground Die Head. Performance is not limited to one application—both steel studs and continuously-threaded bars are produced at 581 R.P.M. (76 surface feet per minute).

Chaser life is excellent. For example: 10,000 studs of B 1113 steel, having a 1/2" UN thread 3/4" in length, are produced between chaser grinds. Furthermore . . . in the continuously-threaded rod application, with 1/2" 13 pitch UN threads in 12-foot lengths, 150 bars of B 1113 steel (1800 linear feet of thread) are produced between chaser grinds. The long life between chaser grinds is the result of using a rugged LANCO die head equipped with LANDIS Tangential Chasers which can be reground for 80% of their original length.

The 5C LANDMACO Machine is manufactured in a single-spindle model for threading all diameters from 3/16" to 5/8" to Class 4 fit. The availability of lead screw feed, air-operated carriage return, air-operated carriage fronts, and special fronts for difficult-to-grip workpieces allow maximum production efficiency. Send us specifications of your workpiece and ask for Bulletin H-74 . . . let us show you how a LANDMACO Machine will handle your threading operation efficiently and economically.



LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA • U. S. A.

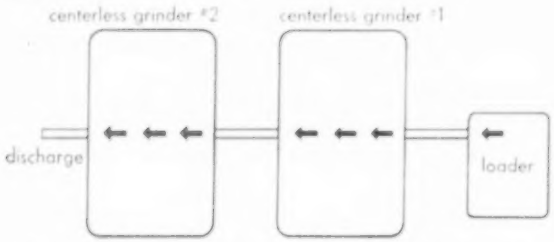
THE WORLD'S LARGEST MANUFACTURER OF THREADING EQUIPMENT

517C

CIRCLE 107 READER SERVICE CARD

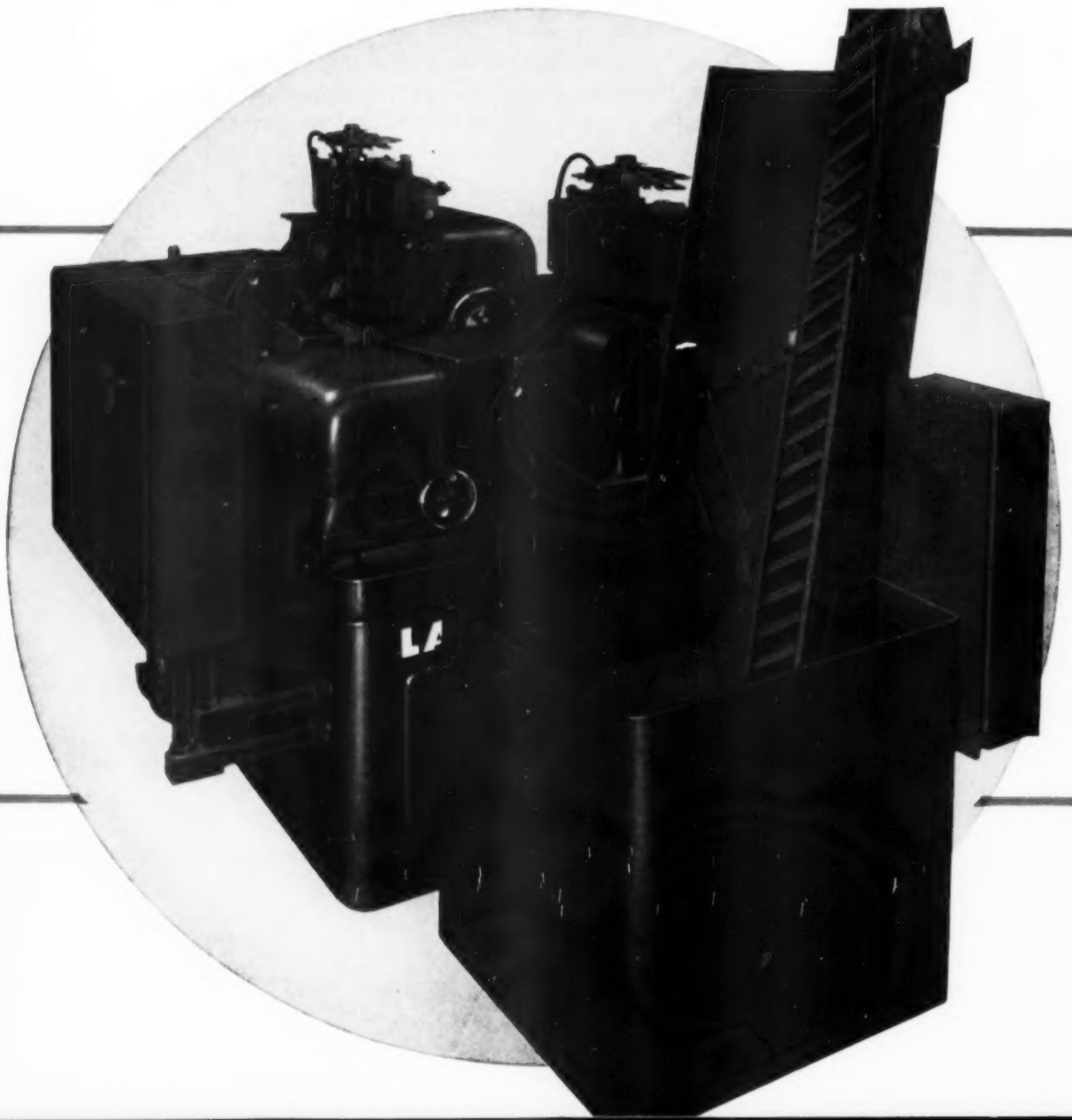
3 cost cutting ideas with

① 2600 pieces per hour with automatic loading and transfer of small parts



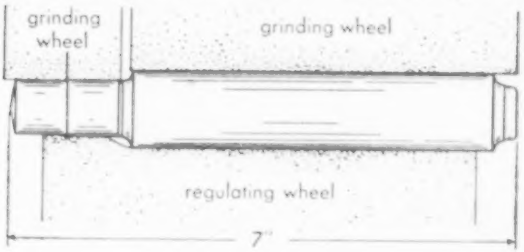
Machines	Two Landis No. 12 Centerless Grinders
Operation	Thrufeed grinding
Part	Pinion gear pins, ⅜" x 1⅛"
Stock Removal	.016" total
	.008" each machine—roughing
Production	2600 per hour
Tolerance	.001"—roughing

Two Landis No. 12 Centerless Grinders with automatic loading, transfer and unloading.



Landis Centerless grinders

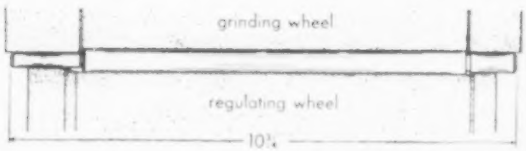
② 3 diameters at one time – 266 parts per hour, automatically

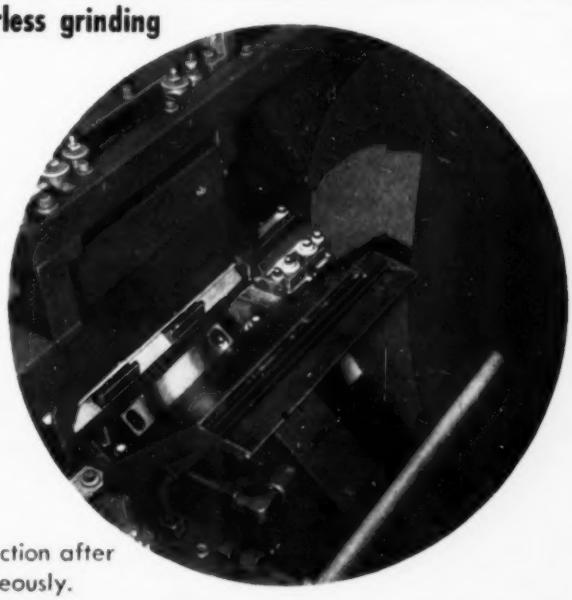


Machine	Landis No. 12 Centerless Grinder
Operation	Rough grinding 3 diameters at one time
Part	Steering gear worm
Stock Removal	.010" from each diameter
Production	266 parts per hour
Tolerance	.001"—roughing

Steering gear worm in carrier ready to be transferred to grinding position.

③ automatic loader speeds 3-diameter centerless grinding





Machine	Landis No. 12½ Centerless Grinder
Operation	Grinding 3 diameters at one time
Part	Distributor shaft
Stock Removal	.006" roughing
	.005" semi-finish
	.001" finishing
Production	320 roughing
	320 semi-finish
	350 finishing
Tolerance	.0005"

Distributor shaft ready for ejection after grinding 3 diameters simultaneously.

LANDIS
precision grinders

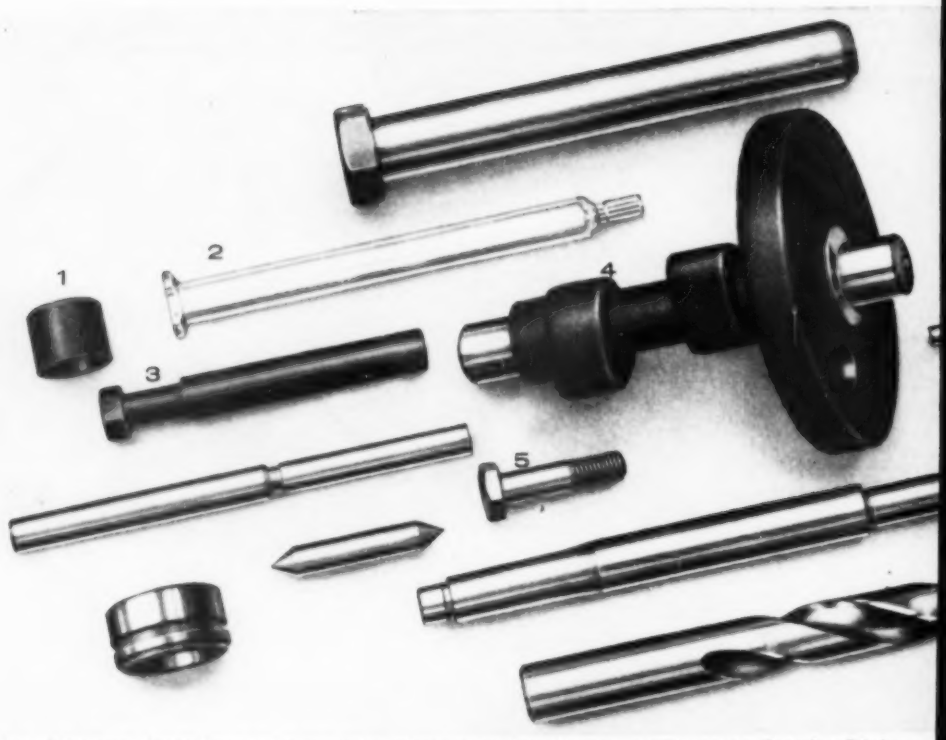
LANDIS TOOL COMPANY / WAYNESBORO, PENNSYLVANIA

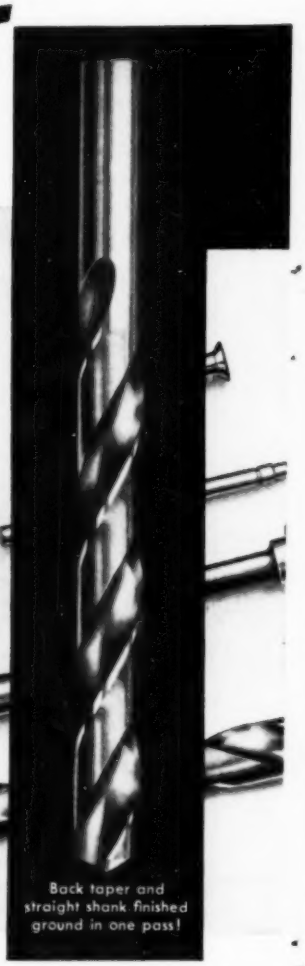
1200 close-tolerance

with a

VAN NORMAN 2C *DIVERSIMATIC*®

CENTERLESS





Back taper and straight shank finished ground in one pass!

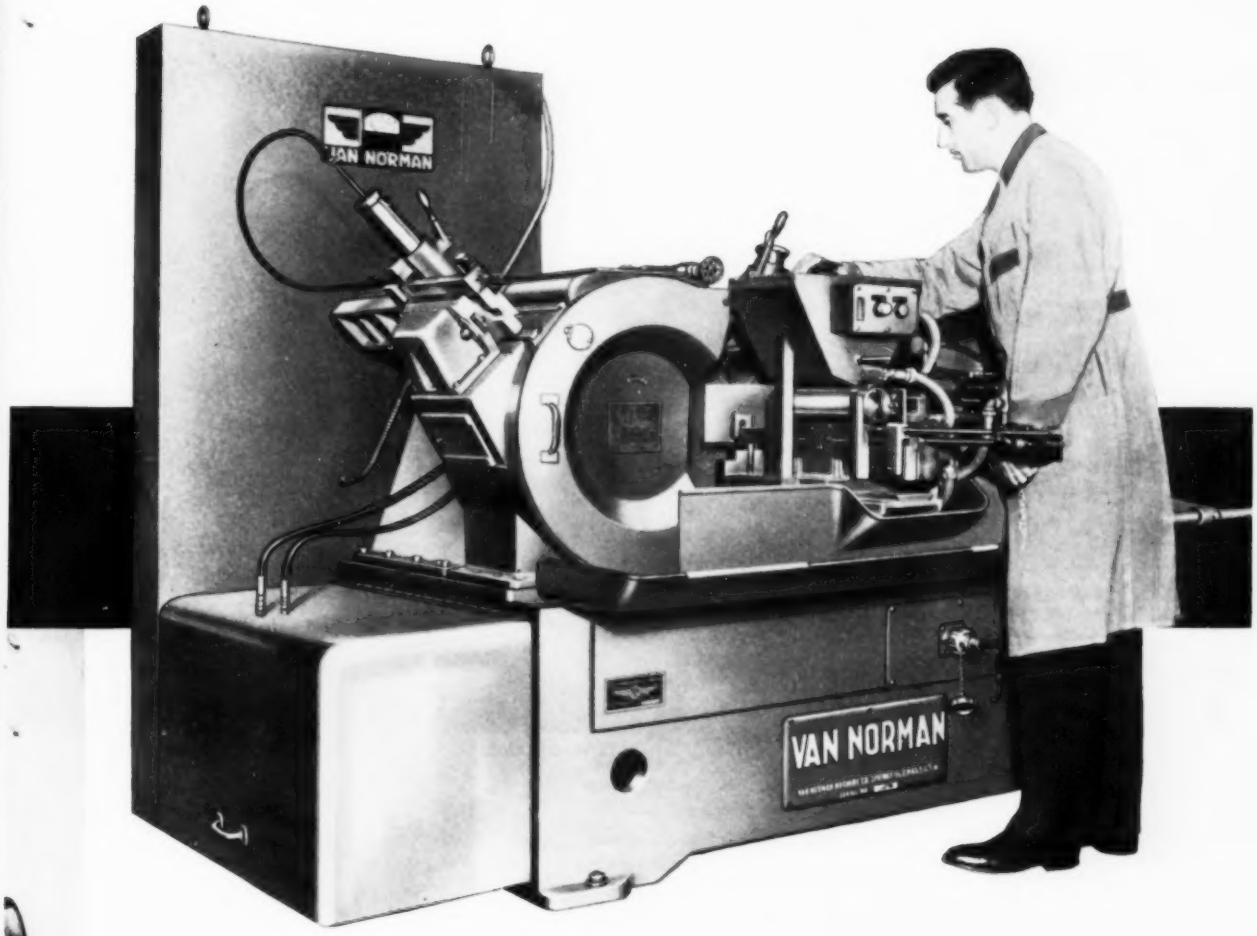
A few of the many close-tolerance parts now being volume-produced by Van Norman Diversimatic Centerless Grinders. Part #1 is made of graphite; #2, glass; #3, plastic; #4, cast iron; #5, Titanium. All other parts shown are steel.

VAN NORMAN MACHINE

SPRINGFIELD 7, MASSACHUSETTS

MANUFACTURERS OF — Ram and Column Type Milling Machines, Cylindrical Grinders, Spline and Gear Grinders, Oscillating Radius Grinders, Special Production Grinders, Centerless Grinder .

finished ½" drills per hour—



Using a 2C Diversimatic, with special automatic loading and unloading mechanisms, Morse Twist Drill, one of the country's largest manufacturers of precision twist drills, grinds 1200 high speed ½" twist drills per hour! Stock removal is .006, grinding the back taper and straight shank in one pass, maintaining tolerances of $\frac{+.0005}{-.0000}$.

Morse is but one of many manufacturers who have found that Van Norman 2C Diversimatic Centerless Grinders help them increase production and hold down production costs. Find out now how Van Norman Diversimatic Centerless Grinders can help you with your volume-production problems — write, wire or phone now for more information.

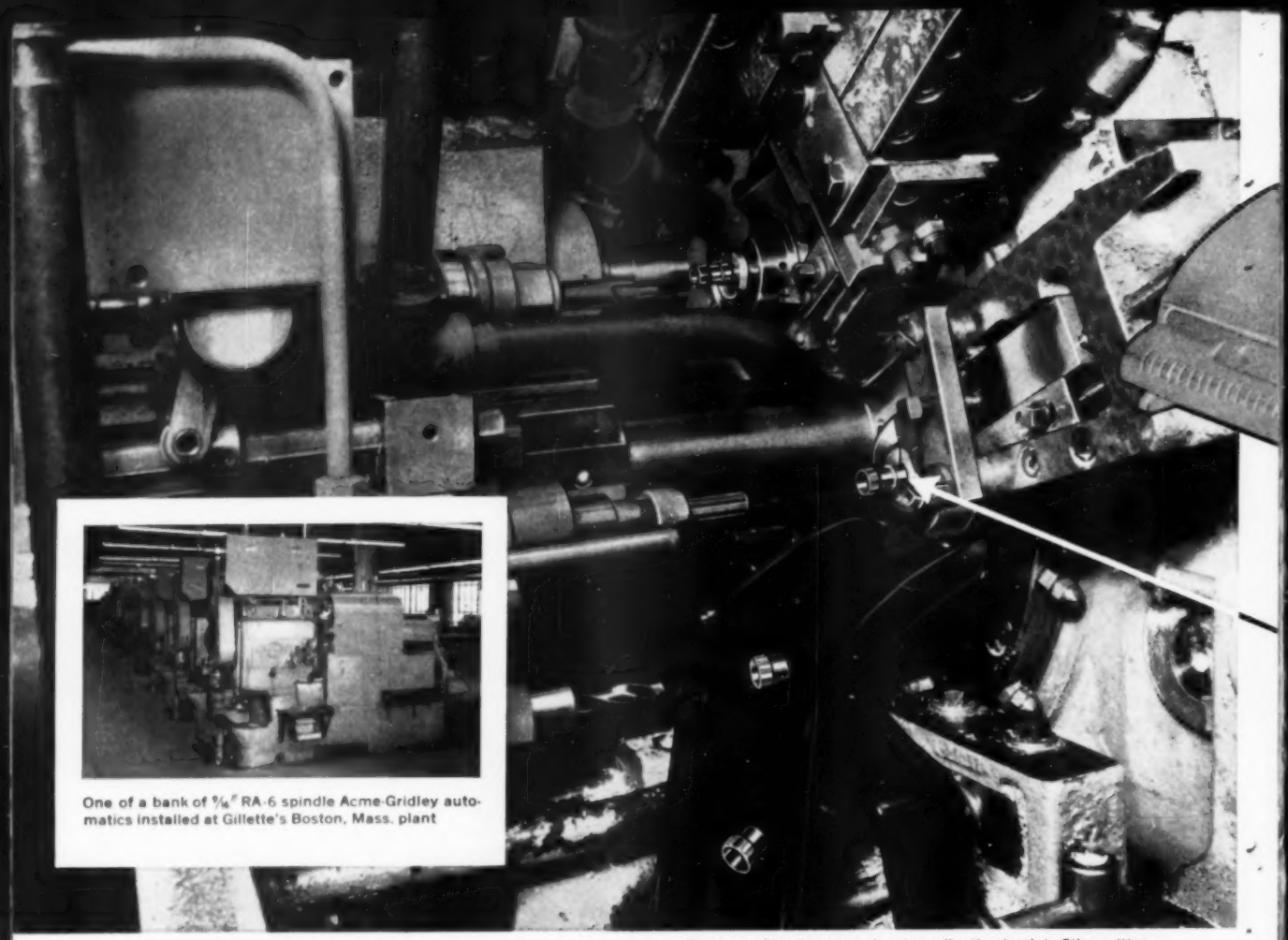
NOTE: The Van Norman 2C Diversimatic Centerless can be equipped with the exclusive Van Norman crush-former which greatly increases the range of close-tolerance parts you can volume-produce.

COMPANY

A DIVISION OF
VAN NORMAN INDUSTRIES, INCORPORATED

Don't wait . . . for extra profit install a Van Norman machine now!
They are available in many purchase plans . . . Outright sale . . .
Purchase on conditional sales contract up to five years . . .
Pay as you depreciate up to 10 years.
Conditional Sales Contracts not available to Export.

*T.M. Reg. U. S. Pat. Off.



One of a bank of ¾" RA-6 spindle Acme-Gridley automatics installed at Gillette's Boston, Mass. plant

Close up of tooling zone showing adjusting knob in 5th position

Precisely Formed, Marked, Knurled,

Broached, Micro-finished, Reamed and Tapped . . .

ON ONE ACME-GRIDLEY AUTOMATIC

in *4½ Seconds!*

The adjusting knob on this new adjustable razor is but one of its several precision components made by The Gillette Safety Razor Company on 9/16" Acme-Gridley six spindle bar automatics. The requirements were extremely exacting, *with as many operations as possible performed in the primary setup!*

For example: nine positions are stenciled on a turned portion of the O. D. with interrupted knurling held in exact peripheral location to the marking. In addition, close tolerance hole sizes are involved and *all* external burrs completely removed. All tools had to be synchronized to produce the exacting number-knurl relationship on the periphery.

Working in close cooperation with Gillette engineers, National Acme specialists took full advantage of the wide-open tooling zone, independently operated tool slides and the extreme accuracy and flexibility of direct camming . . . to perform an ingenious job of tooling. Many operations normally considered "secondary" were accomplished in the primary setup. Costly rehandling and "second machine investments" were reduced.

Write or ask one of our representatives for the complete story on the industry's most modern approach to *your* cost reduction problem.

Pioneer in
Circumferential
Automation

National Acme

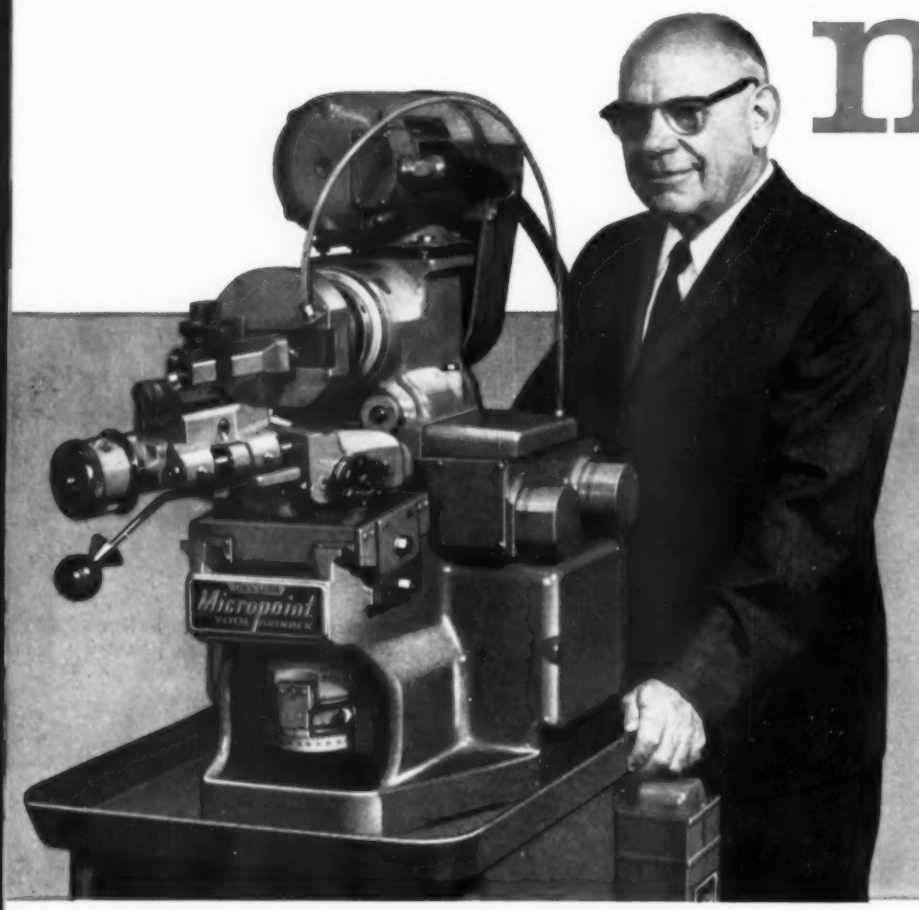
The National
Acme Company
171 E. 131st Street
Cleveland 8, Ohio

Sales Offices: Newark 2, N.J.; Chicago 6, Ill.; Detroit 27, Mich.

NEW FROM FAIR STREET • HOME OF THE JIGMIL

mic

the first grinder



"Micropoint is the first machine in its field able to grind tool profiles geometrically correct to gage room accuracy"

"MICROPOINT is not just another grinder. It's a precision machine that makes possible a new technique of single point tool grinding. Advantages of this new technique include greater cutting tool life, increased accuracy and output of machine tools and greatly improved uniformity and finish of the end product. Originally developed for our own use, MICROPOINT became necessary in our continuing pursuit of accuracy."

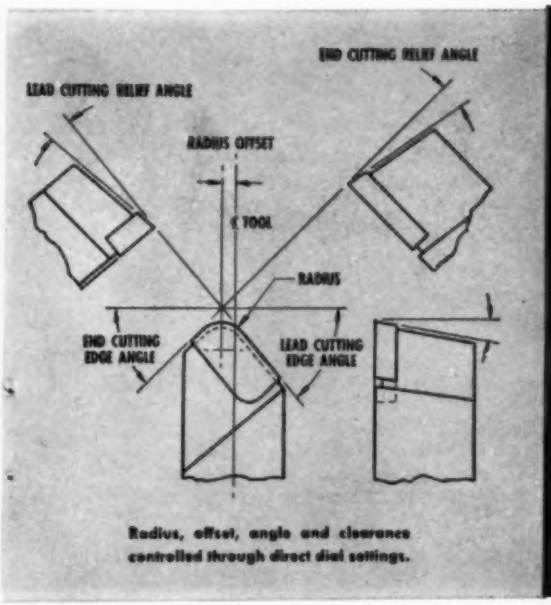
C. B. DE VLIEG

DE VLIEG MACHINE COMPANY, FAIR STREET • ROYAL OAK, MICHIGAN

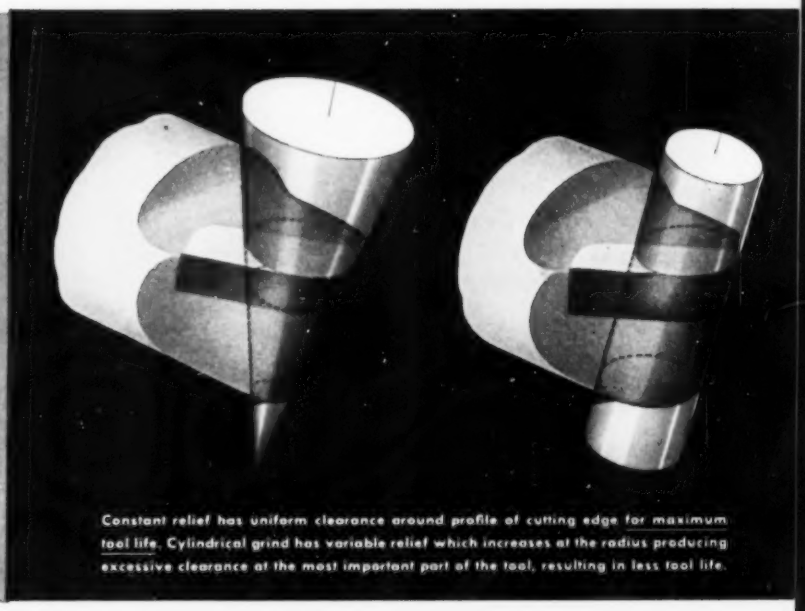
CIRCLE 114 READER SERVICE CARD

ropoint®

capable of absolute control of tool geometry



Radius, offset, angle and clearance controlled through direct dial settings.



Constant relief has uniform clearance around profile of cutting edge for maximum tool life. Cylindrical grind has variable relief which increases at the radius producing excessive clearance at the most important part of the tool, resulting in less tool life.

DIRECT DIAL SETTINGS reduce the possibility of human error and provide a method of fast, simple, accurate adjustment for each radius, angle, offset and clearance in exact accordance with the geometric requirements of the tool. With a minimum of operator training, tool profiles can be controlled to .0001". Set-ups can be made quickly and with precise accuracy. Operators have ground as many as 300 identical tools in one set-up without corrective adjustment. Because of the machine's unique design, diamond wheel cutting life has been increased 4 to 6 times. Field tested for three years, many MICROPOINT grinders are already in use throughout industry. Available from your DeVlieg distributor.

Write for Micropoint Tool Grinder Catalog

REWARDING REVELATIONS IN PRECISION
AWAIT YOUR VISIT TO FAIR STREET

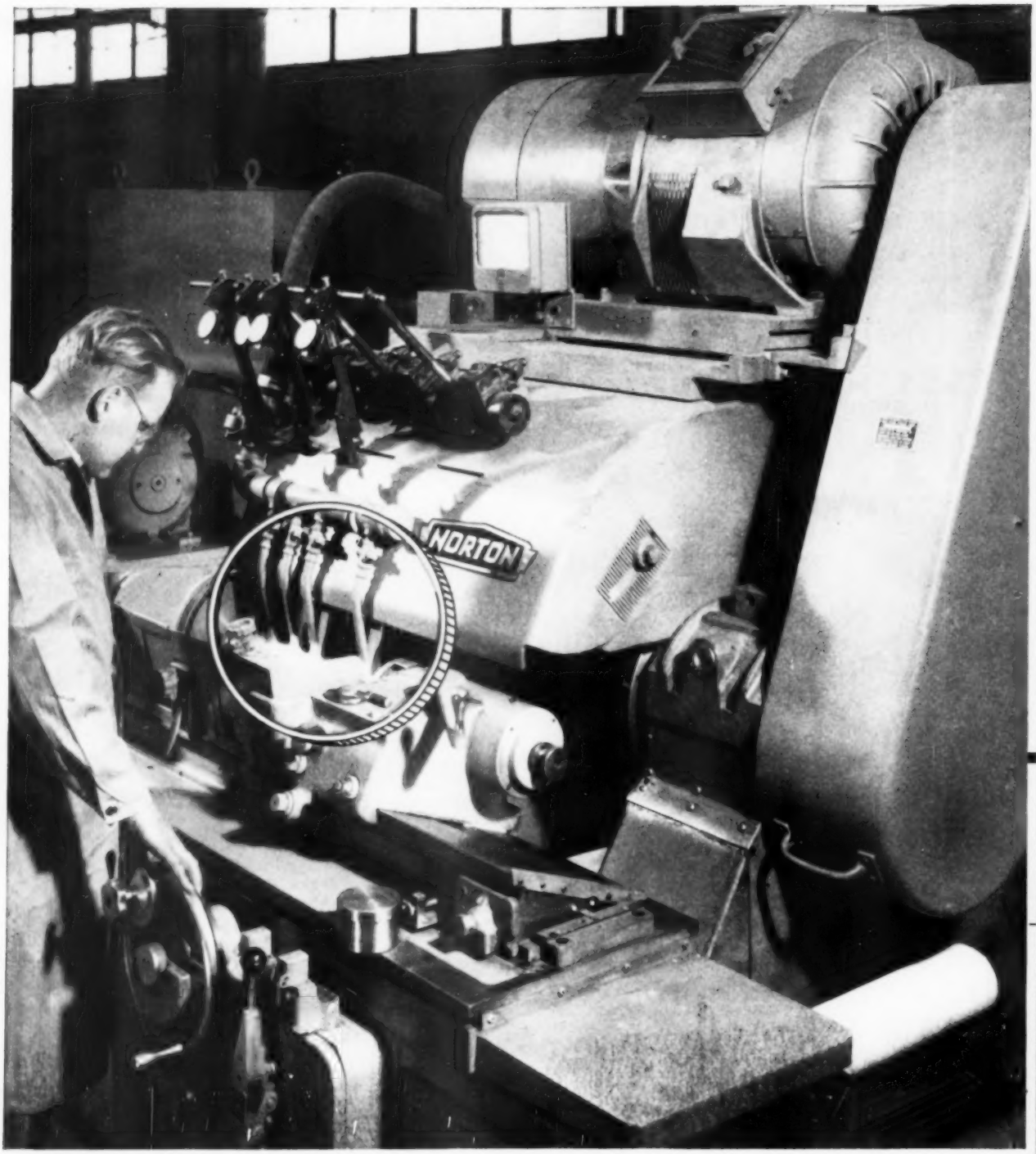
DeVlieg

MICROPOINT® TOOL GRINDER

Geometrically correct tool points ground to gage room accuracy!

CIRCLE 115 READER SERVICE CARD

Grinding multi-diameter parts



Replacing Four Separate Grinders, a Norton CM-1 grinds four diameters simultaneously — in a fraction of the time it used to take to finish this job. A great new production tool, the Heavy Duty Multi-Wheel CM-1 can perform even more grinding operations at once — on crank and camshafts, transmission and motor shafts and other multi-diameter parts. The machine has also been arranged for grinding pin diameters in multiple on crankshafts with pins lying in the same plane. And power-assist loading mechanism is available for many applications.

this fast, easy, accurate way...

cuts operating time and costs

Norton Type CM-1 Multi-Wheel Grinder reduces your operating expenses and capital investment by completing several jobs at once

You can get one grinding machine that does the work of several, in a fraction of the working time — bringing you considerable savings on purchase costs, operating costs and floor space.

That machine is the Norton Type CM-1 Heavy Duty Semiautomatic Multi-Wheel Grinder.

The CM-1 makes four or more cuts in a single plunge-grind cycle, operating automatically under one-lever control. And it completes each separate grinding operation with the accurate, trouble-free performance that's built into every Norton grinding machine.

Typical Advanced Features

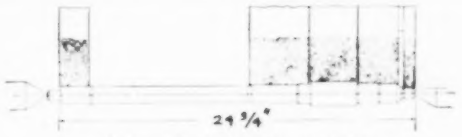
- Cartridge type bearings at each end of heavy, 10"-diameter wheel spindle assure extreme rigidity of spindle, longer wheel life, greater accuracy and control with minimum truing.
- Automatic truing device — in rear, out of operator's way — trues straight or formed wheels each individually, yet all at once, thus requiring only the amount of time needed to true widest wheel.
- Automatic compensation for wheel wear, and amount trued off. No adjustment or resetting of wheel needed after truing.
- Optional equipment includes built-in automatic sludge remover and coolant filter, constant peripheral wheel speed control, automatic work loading and unloading equipment.

Why not get the complete story of how the CM-1 can bring the cost-reducing, profit-boosting "Touch of Gold" to your grinding operations? See your Norton Representative, or write us direct. And remember: only Norton offers you such long experience in both grinding machines and wheels to help you produce more at lower cost. NORTON COMPANY, Machine Division, Worcester 6, Mass.

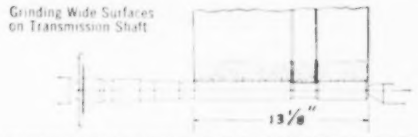
To Economize, Modernize with NEW

NORTON

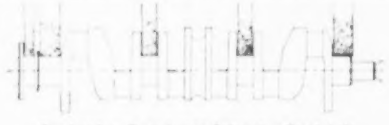
GRINDERS and LAPPERS



Combining Five Cuts on Transmission Shaft



Plunge Grinding Five Camshaft Bearing Diameters



Grinding Line-Diameters on Automotive Crankshaft

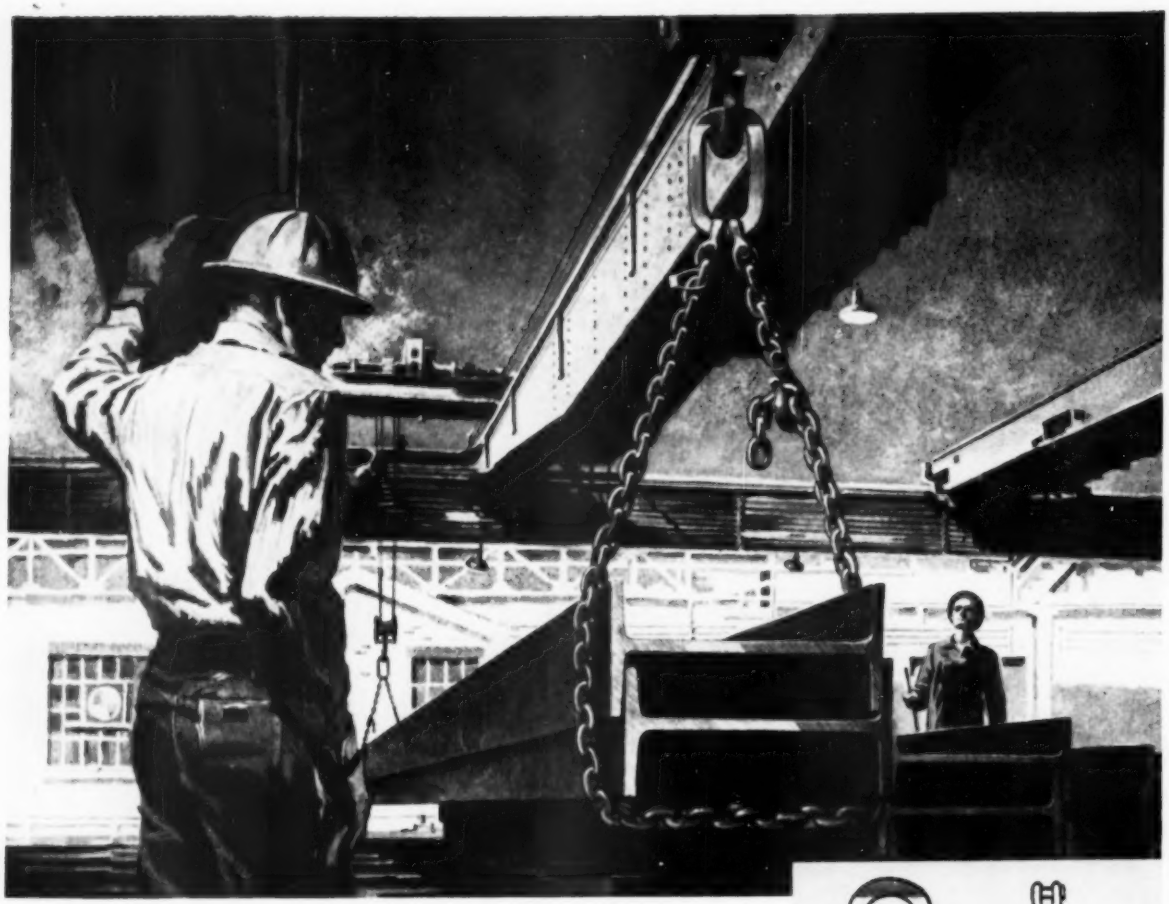
Versatility that Meets Many Needs. On the CM-1, workpieces can be up to 36" in length. As shown in these four typical diagrams, grinding wheels can be located, close together or far apart, as required. And regardless of the number of wheels in any group, their combined widths — plus spacing collars — can total up to 30", exceeding the widest group shown here. This Norton-engineered versatility brings progress and profits to your diameter grinding — because with the CM-1 you can actually finish a group of line-diameters in approximately the time you've been spending on a single diameter grind.

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — BEHR MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

District Offices: Worcester • Hartford • Cleveland • Chicago • Detroit — In Canada: J. H. Ryder Machinery Co., Ltd., Toronto 5.

CIRCLE 117 READER SERVICE CARD



NEWS from American Chain:

ACCOLOY KUPLEX Sling Chains...

Fast assembly—quick delivery from your Kuplex distributor

The ACCOLOY KUPLEX is the first and only sling chain completely engineered as a unit that is quickly available in whole or in part from Authorized Distributors. Made up entirely of matched and engineered components, each part is designed and manufactured specifically for use with all other parts of the complete KUPLEX Sling assembly. It is a streamlined sling chain that greatly reduces the possibility of snagging on other objects.

All parts are made to ACCO *Registered* Specifications from heat treated ACCOLOY steel, and are engineered to be as strong as the chain itself. All are factory proof-tested to twice working load limits. Hooks and Kuplers are magnaflux-tested. These facts are covered in a CERTIFICATE OF TEST issued by ACCO and signed by the distributor with each complete sling purchase.

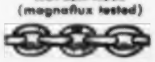
Fast Service from Distributors' Stocks • An ACCOLOY KUPLEX Sling gives you an assurance which is lacking when you use homemade slings of questionable reliability. It gives you new parts for worn or damaged slings without delay. Thanks to the fast service available through a nearby distributor, you can be assured of having the sling you need when you need it. This also means that your inventory investment in sling chains can be held to a minimum.

Write our York, Pa., office for the name of the Authorized KUPLEX Sling Chain Distributor nearest to you.

Accoloy Shaped Master Link

Accoloy KUPLEX Hook (magnaflux tested)

Accoloy Kupler (magnaflux tested)



Accoloy 123 Chain (X-weld or Endweldur)

SIX SLING SIZES WITH THESE FOUR COMPONENTS

• A nearby Authorized ACCOLOY KUPLEX Sling Distributor can furnish promptly from his stock the exact sling chains you need for your specific requirements; made up from the components shown above. Six chain sizes ($\frac{1}{4}$" through $\frac{7}{8}$") are available in single, 2-leg, 3-leg or 4-leg styles.

American Chain Division

AMERICAN CHAIN & CABLE

Bridgeport, Conn. • Factories: *York and *Braddock, Pa.

Sales Offices: *Atlanta, Boston, *Chicago, *Denver, Detroit, *Houston, *Los Angeles, New York, Philadelphia, Pittsburgh, *Portland, Ore., *San Francisco

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ACCO

A·C·C

TRADE MARK

news for users of precision surface grinders

LANDIS TOOL ACQUIRES LINE OF SURFACE GRINDING MACHINES

Takes over line of
ABRASIVE MACHINE TOOL COMPANY
East Providence, Rhode Island

To this leading line of surface grinders will be added over 60 years of experience in developing, designing and manufacturing precision grinding machinery.

For literature or quotations on any of the precision surface grinders in the abrasive line, consult your present Abrasive distributor, or write to Landis Tool Company, Waynesboro, Pennsylvania.

ABRASIVE
precision surface grinders

a product of
LANDIS TOOL
world's largest manufacturer of precision grinding machinery

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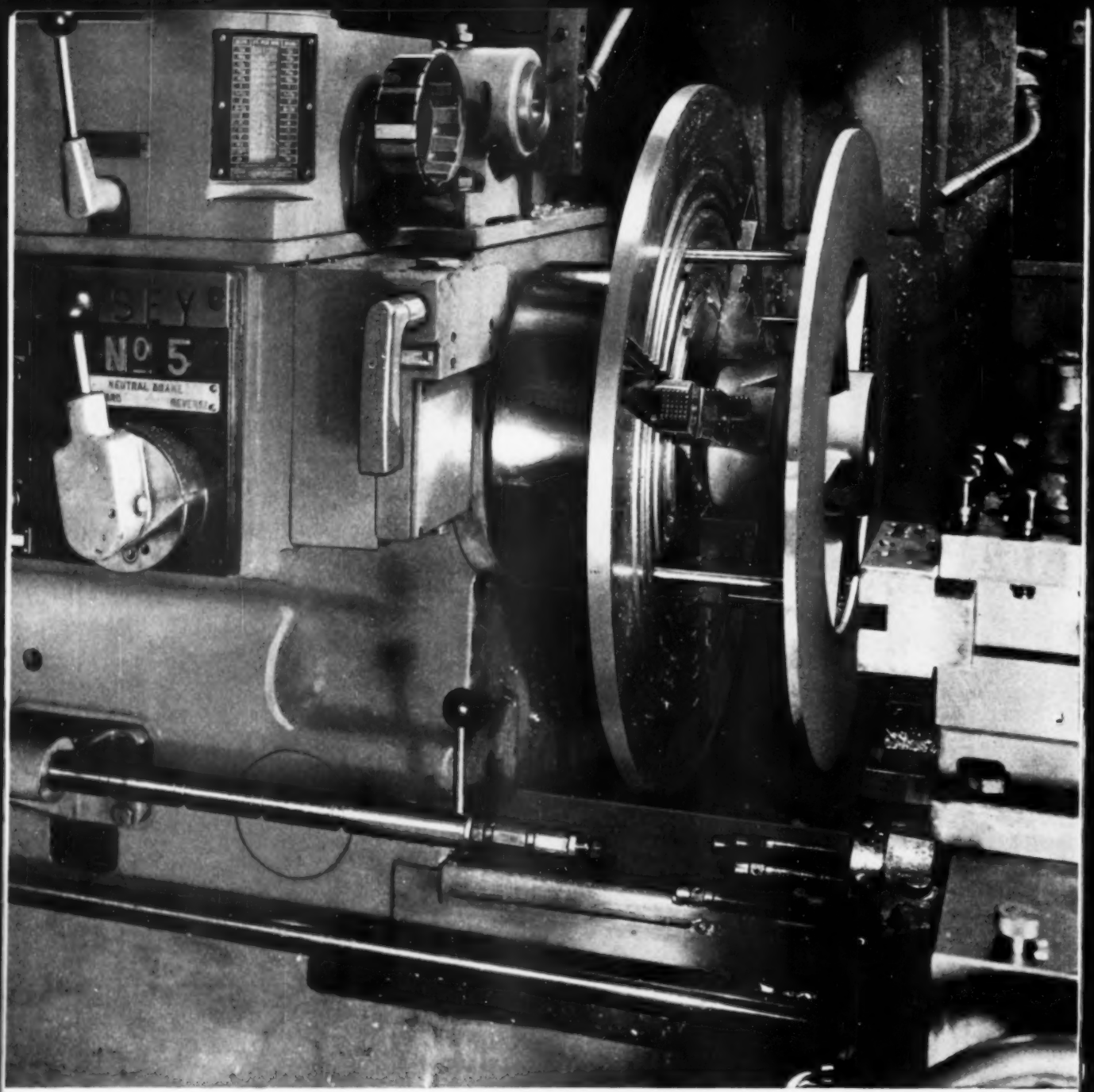
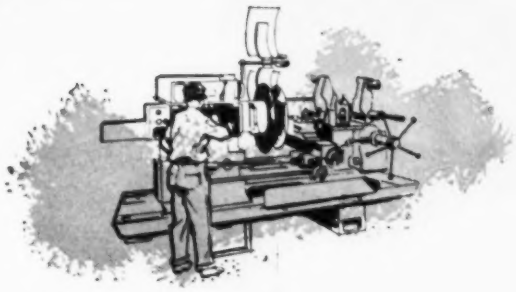


Unique chucking arrangement in action

The versatility of Ilg's adjustable gap bed No. 5 Ram Type Turret Lathe is further increased by the use of a 12-inch air chuck and permanently-mounted face plate. Jaw slots in the face plate permit use of either standard or special top jaws. A series of tapped holes in the face plate allow clamping or back-stopping a range of large diameter parts, such as this 22-inch diameter cast aluminum fan hub. In addition, seven concentric grooves in the face plate accurately locate, on the rabbet diameter, various sizes of motor end bells for second operation machining of their bearing bores. This unique, time-saving chucking arrangement eliminated three face plate fixtures, drastically reduced setup time on lot sizes of 25 to 30 pieces, and permitted efficient handling of chucking work from 4 to 24 inches in diameter.

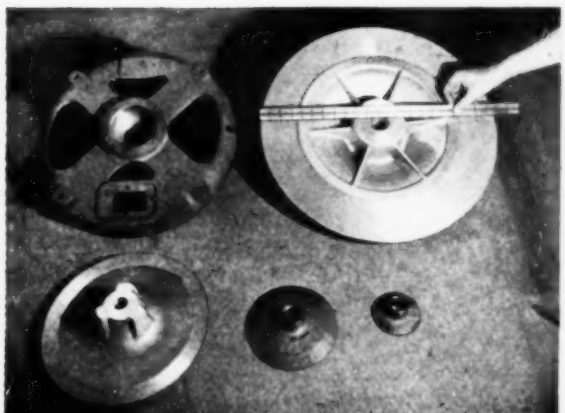
CIRCLE 120 READER SERVICE CARD

At Ilg Electric Ventilating Company...
Chicago, Illinois



Sliding gap bed extends chucking swing to 30 inches on Warner & Swasey No. 5 Ram Type Turret Lathe

Handling large swing parts now poses no problem. On smaller diameter chucking jobs, the gap can easily be closed—permitting the cross slide to work in close as on a conventional No. 5 Turret Lathe.



This leading producer of industrial heating and ventilating equipment had a replacement problem. In order to maintain their usual high standard of quality without increasing their costs, Ilg had to replace an older saddle type turret lathe that had been handling workpieces up to 24 inches in diameter. Lot sizes averaged 25 to 30 pieces. A new saddle-type lathe appeared to be the answer. However, all the other job factors—length of workpieces, metal removal capacity ($\frac{1}{8}$ to $\frac{3}{16}$-inch), and horsepower requirements—indicated the need for a smaller capacity, faster handling ram type machine.

Investigation revealed that a new Warner & Swasey No. 5 Ram Type Turret Lathe, with a sliding gap bed, would handle their type of production most economically.

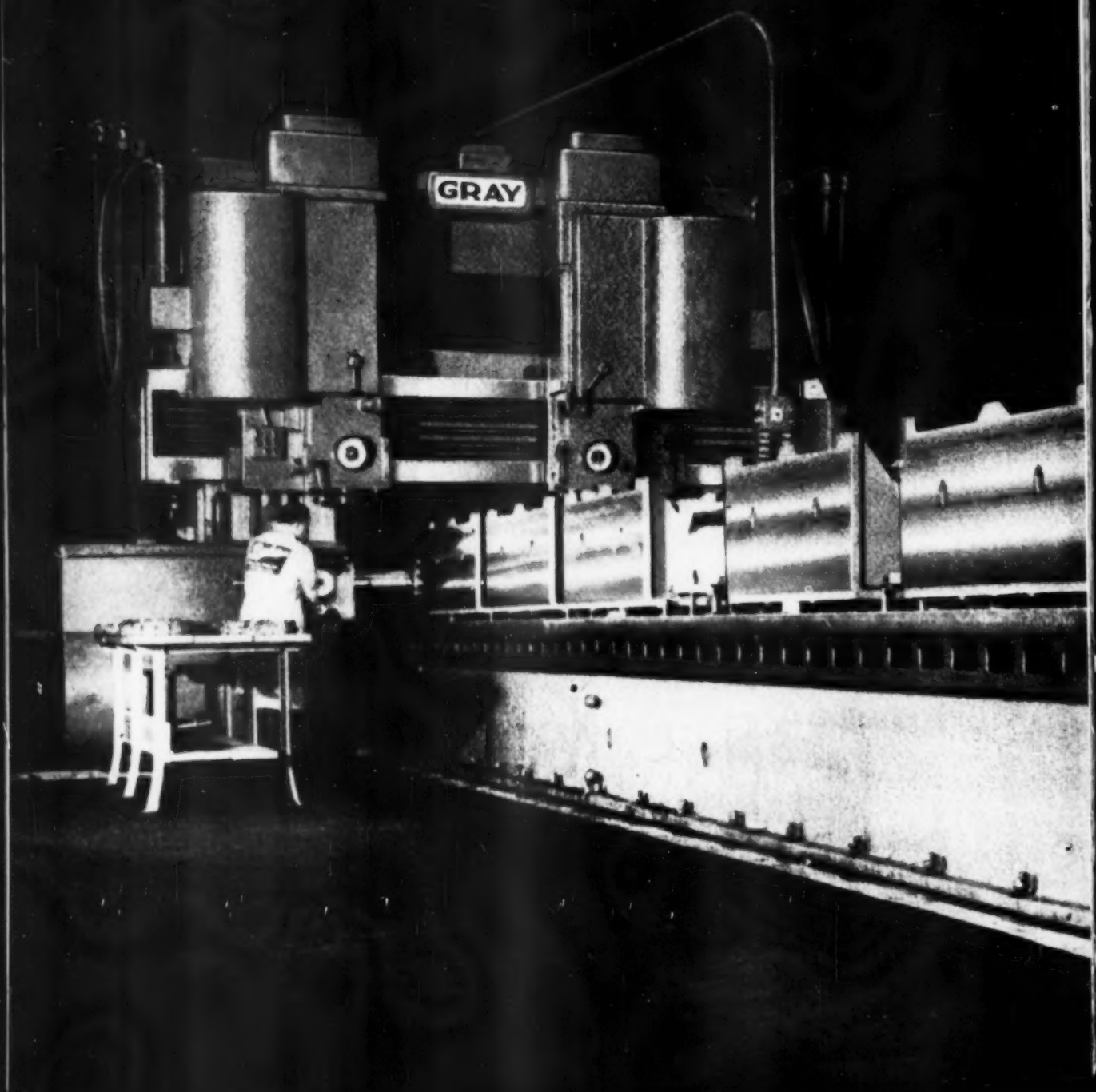
After installation, Ilg Electric reports, "the machine's accuracy and rigidity easily hold our close tolerances (±.001 on rabbet diameter of motor end bells and .0005 in bearing bores). Further, it gave us higher speeds and instantaneous shifting for greater cutting efficiency in our work materials (aluminum, cast iron and steel). Overall machine handling time and operator effort were also reduced. Production increased as much as 65% on some parts."

WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

You can produce it better, faster, for less... with a Warner & Swasey

CIRCLE 121 READER SERVICE CARD

progress starts

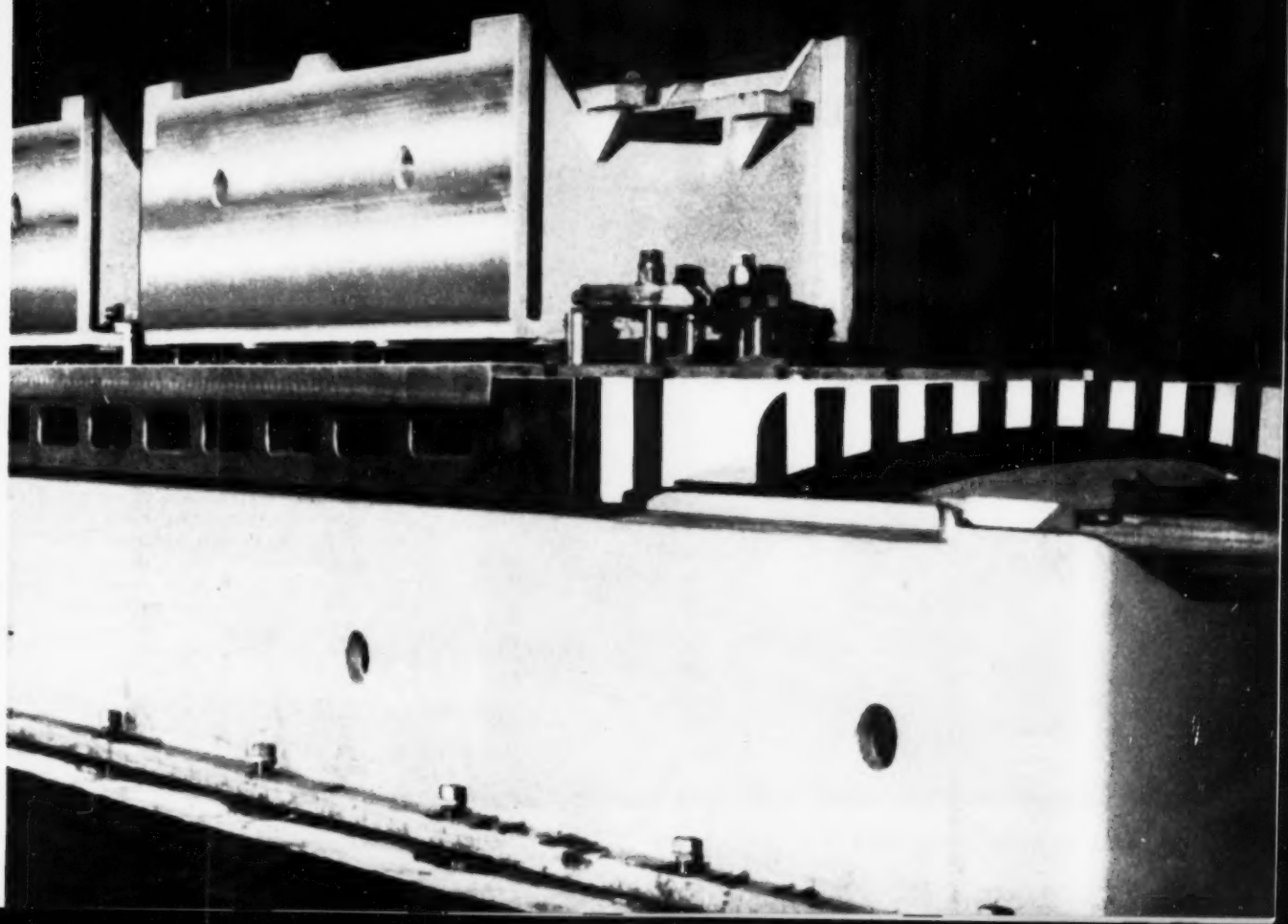


on a GRAY

What you see being milled on this big 105 foot long Gray, are transfer machine bases of the future...six at a time...automation production machines of Buhr Machine Tool Co., of Ann Arbor, Michigan. It's logical that this company, engaged in producing cost cutting, time saving equipment, should select a cost cutting, time saving Gray todo the job.

Gray unit head planer type millers dominate the field of modern heavy duty milling. This 66" x 66" x 50' giant can simultaneously deliver 300 H. P. to its four cutters. Duplex tables virtually eliminate idle time by permitting work set-up on one section, while work is being milled on the other section. Unusually simple control encourages maximum operator efficiency. All this, plus mirror smooth surfaces milled to precise tolerances maintain the Gray reputation for top quality the world over.

The G. A. GRAY Co., Cincinnati 7, Ohio



ELECTRONIC and ULTRASONIC quality control of MUELLER rod, tube, fabricated parts and

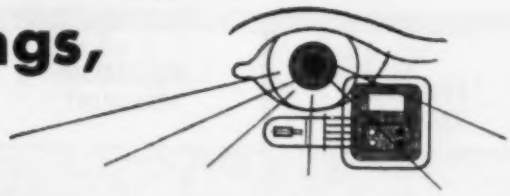
Every practical electro-mechanical testing device available to industry today is used by the Mueller Brass Co. to maintain Positive Quality Control during each manufacturing operation. From the first stages of alloying, spectroscopic analysis is used to maintain exact alloy composition so that they are precisely as specified. Ultrasonic test equipment is utilized in the non-destructive testing of extruded brass and bronze rod, copper tube, forgings and fabricated parts. In machining and finishing operations, statistical quality control is employed to eliminate the effect of possible human error. These quality controls are all designed for one purpose . . . to give you complete "product protection."

•

Copper base alloy rod is examined by a trained operator with the aid of an ultrasonic reflectoscope. Through electronic circuitry, ultrasonic echoes are translated on a cathode ray tube. Any internal flaws are readily apparent. Both rod and tube are tested by this method, which is just one of many Positive Quality Control checks used by the Mueller Brass Co.

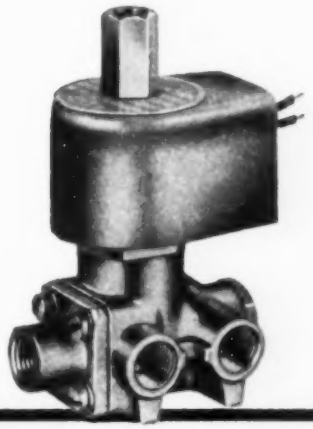
Through ultrasonics, the immerscope (Left) locates internal defects, and has exceptional versatility for examining intricately shaped parts, such as the forging being checked in this photo. When testing, a transducer, located at the bottom end of the search tube, is electronically actuated to produce from 2.2 to 25 million cycles per second. Ultrasonic echoes are reflected back to the transducer from the material, indicating any defects that may be present. Limits may be pre-established and the sound findings are visually recorded on the cathode tube. This is another instance of Positive Quality Control in action.

TESTING helps insure positive BRASS CO. forgings, assemblies...



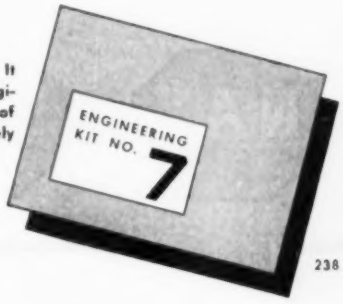
The direct reading spectrometer (Left) makes it possible to accurately analyze an alloy for chemical composition within 90 seconds while the metal is in the molten stage. A sample specimen is poured, cooled and sent to the laboratory, where it is placed in the spectrometer. Through the diffraction gratings in the machine, the "spectrum" analysis of the alloy records its exact chemical composition. With this equipment, alloy specifications are matched exactly, thus insuring a better finished product through Positive Quality Control.

THIS MIDGET 4-WAY SOLENOID VALVE (Right) is one of a complete line designed and manufactured by the Automatic Switch Co. (ASCO) of Florham Park, New Jersey. Valves of this type are used for controlling small double acting cylinders which operate valves, dampers and many types of automatically controlled equipment. One of the most important components in these valves is the non-porous brass body forged by the Mueller Brass Co. who also perform all the major machining operations so that the body is ready for use upon delivery. The forged brass body insures freedom from porosity and reduces possibility of corrosion. The Mueller Brass Co. Positive Quality Control program insures ASCO complete "product protection". . . and eliminates chance of "in-service" failures.



THIS LARGE 18" FORGED GEAR, along with two others of the same type, is used in a steam turbine installed in a power generation facility of the Wisconsin Electric Power Company, at Port Washington, Wisconsin. The gear was forged in open dies by the Mueller Brass Co. from tough, long-wearing 603 alloy. The gear operates at 25-30 RPM and is turned by the turbine, which has a capacity of 80,000 kilowatts. Strength and dependability are of utmost importance in applications like this, and in such cases Positive Quality Control insures peak performance.

Write for your engineering kit no. 7. It contains complete laboratory and engineering data plus typical examples of Mueller Brass Co. products used in widely diversified applications.



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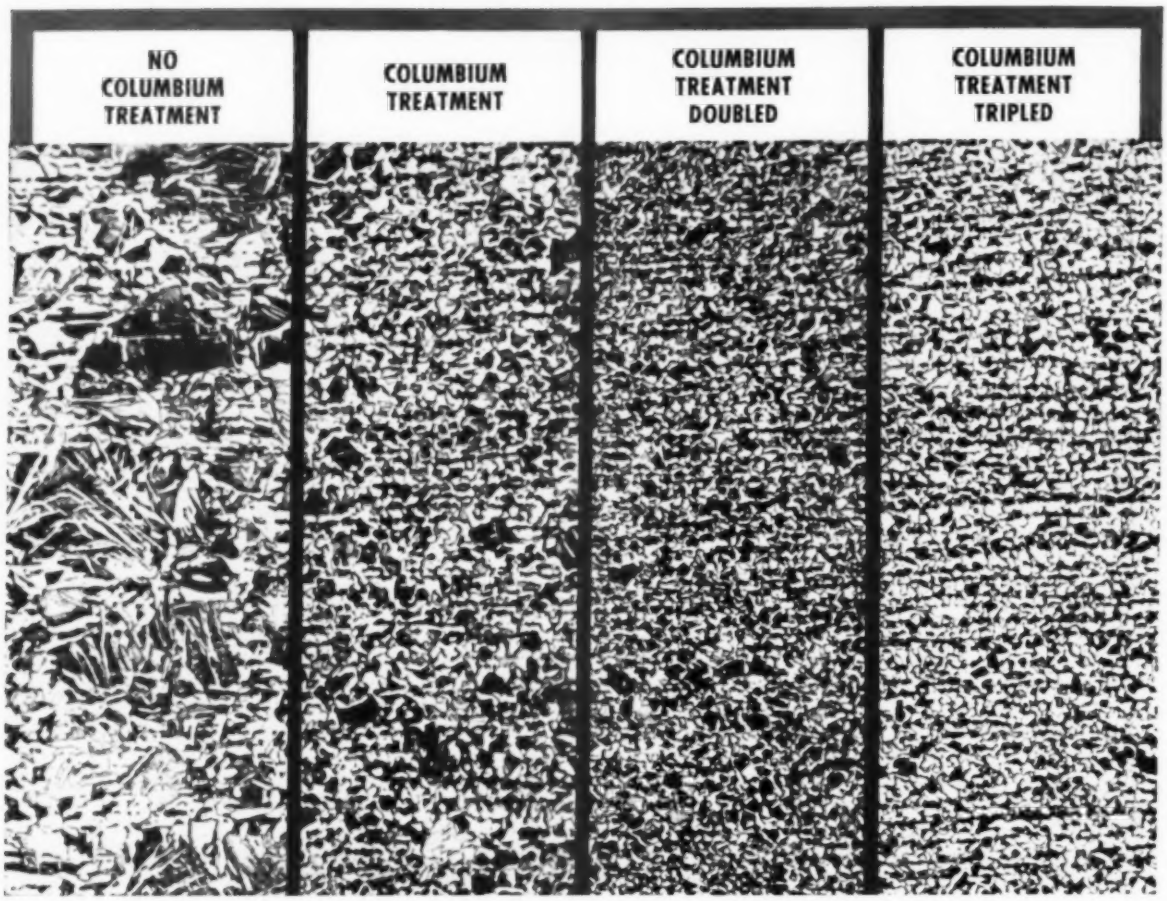
MUELLER BRASS CO. PORT HURON 24, MICHIGAN

HOW GREAT LAKES



Composite of photomicrographs made from the same heat of mild carbon steel shows the effect of varying columbium treatments on the grain structure of the steel.

The Great Lakes Family of High-Strength Steels

N·A·X FINEGRAIN STEEL

Lets you design superior performance, longer life and less weight into your product. Many diversified applications.

N·A·X HIGH-TENSILE STEEL

Offers all the characteristic features of N-A-X Finegrain, plus greatly enhanced resistance to atmospheric corrosion.

GLX W

A series of fine grained, mild carbon steels. They have unusually high strength, toughness and weldability.

N·A·X N-A-XTRA STEELS

Quenched and tempered steels of excellent weldability and toughness, with yield strengths from 75,000 - 110,000 psi.

N·A·X HIGH MANGANESE STEELS

N-A-X High Manganese and High Manganese Special Killed. These steels give yield strengths up to 50,000 psi.

STEEL CORPORATION'S NEW GLX-W STEELS GIVE ... HIGH STRENGTH TOUGHNESS REDUCED COSTS

Key to the success of Great Lakes' new GLX-W Series of steels is the fine grained internal structure produced by treatment with columbium. This grain refinement also contributes to ductility. And in addition, the GLX-W Series' low carbon and manganese content assures excellent weldability with freedom from underbead cracking under all conditions.

COST AND WEIGHT SAVINGS

Where design permits the replacement of carbon steel with GLX-W steels, weight savings of 20 to 35 per cent, and cost savings of 10 to 25 per cent can be realized. When replacing alloy steels the cost savings can range from 25 to 35 per cent. These steels feature higher yield strengths, greater tensile strengths and increased toughness without costly heat treatments or extensive alloy additions.

The GLX-W Series is so priced that substantial cost reductions can be obtained by weight reduction over mild carbon steel. Cost reduction can also be obtained over alloy steels because of the lower price of GLX-W steels.

STRONGER AND TOUGHER

GLX-W steels are stronger and tougher than ordinary mild carbon steels and in some applications can do the job now being done by the more costly alloy steels.

MANY USES FOR GLX-W STEELS

GLX-W steels are especially recommended for a broad range of applications in mobile equipment and pressure vessels, as well as the transportation and construction fields.

GLX
W

For additional technical information about these economical GLX-W steels write

Product Development Division, Dept. X-1

GREAT LAKES STEEL CORPORATION

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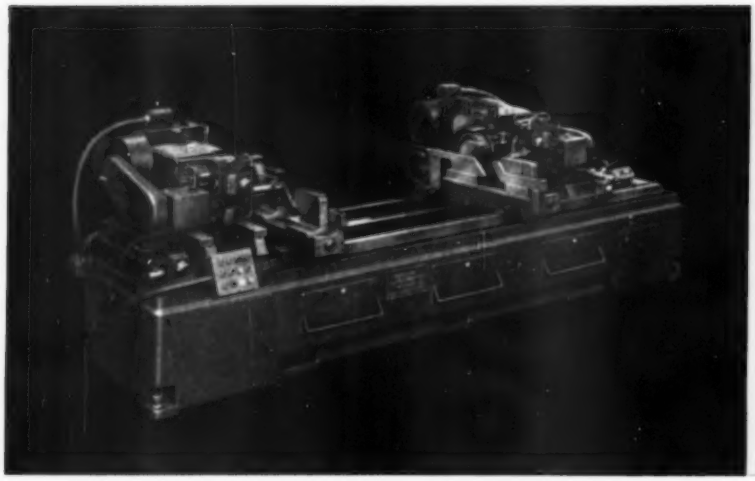
CIRCLE 127 READER SERVICE CARD

These MOTCH AND MERRYWEATHER precision



MILL & CENTER

Model MC 1648. Incorporates two standard milling heads and two standard drilling heads. Feed rates infinitely variable. Right hand unit is adjustable for varying part lengths. Fixtures are self-equalizing vises. Milling and drilling units, and clamping fixtures are hydraulically actuated and electrically controlled.

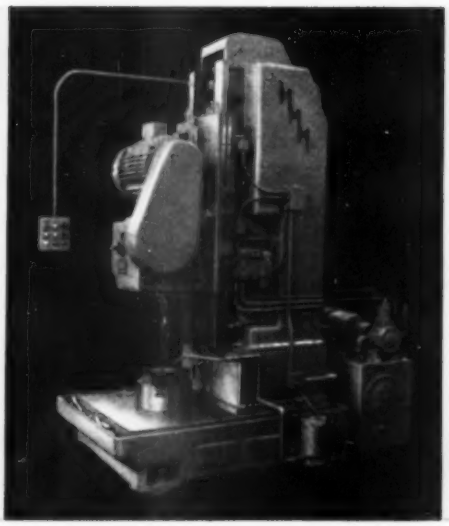
Available in two sizes: 1″ to 6″ diameter; 8″ to 48″ length, with 20 horsepower heads; and 1″ to 4″ diameter; 6″ to 24″ length, with 5 horsepower heads.

cut production costs...

UPRIGHT DRILLING & BORING MACHINE

Model VS 2615. Designed for heavy duty drilling and boring. This machine will accommodate many types of heads, making it adaptable to a wide variety of machining operations. Its standard automatic cycle consists of rapid traverse down, feed, and rapid return. Variations of this automatic cycle are available.

Available with speeds from 30 to 190 RPM, up to 40 horsepower, stroke of either 15″ or 30″, variable hydraulic feed, with maximum pressure of 20,000 pounds.



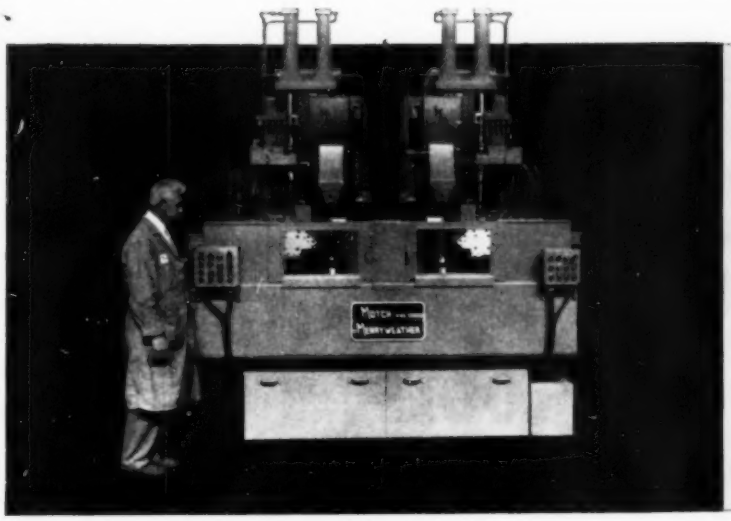
SINGLE END MILL & CENTER

Model SMC. Ideal for tool room or production work. Incorporates standard slide, milling and drilling head, adjustable stock support and stop assembly. Speed of milling and drilling head unit varied by changing easily accessible pulleys and belts. Performing both milling and drilling during one clamping, work is milled square to the center.

Available with diameter from ¾″ to 3½″, length from 4½″ to 48″, and 5 horsepower on the milling head.

speed up subsequent

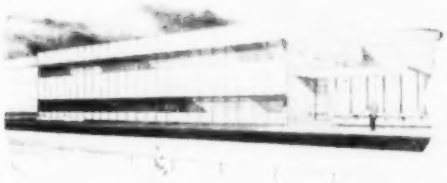
performance machines...



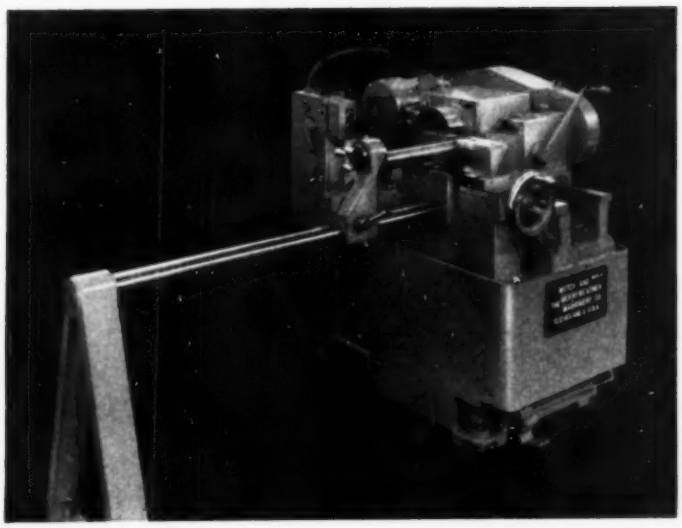
TWO-SPINDLE VERTICAL TURNER

Designed for precision, production-type turning, boring and facing. Two hydraulically-operated, automatically lubricated tool slides are mounted on hardened and ground steel ways with tapered gibs for accurate alignment. Spindle and slide units will operate independently, have separate controls.

Available with 20" swing; spindle speeds from 20 to 5000 RPM; stroke—horizontal 6", vertical 12"; and variable hydraulic feed.



Partial view of M&M's expanded Cleveland facilities. Why not visit us at your first opportunity?



operations

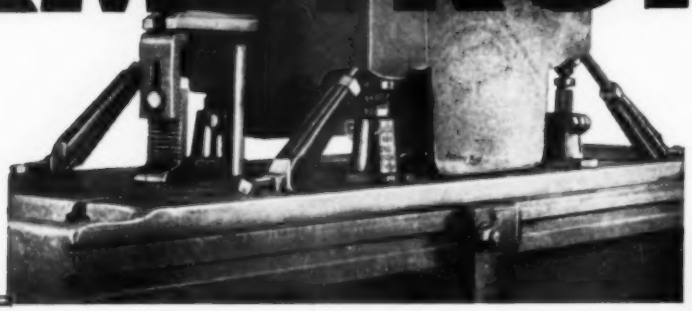
• Keeping pace with the increasing need for flexibility in standard metalworking machinery, M&M offers industry these four highly-flexible, readily-adaptable machine tools.

To learn how they can add flexibility—and dependability—to your machining operations call your Motch & Merryweather representative, or write directly to Motch & Merryweather Machinery Company, 1250 E. 222nd St., Cleveland 17, Ohio.

Machine Tool Manufacturing Division
Cutting Tool Manufacturing Division
CLEVELAND
Avey Division, Cincinnati

BUILDERS OF AUTOMATIC PRECISION CUT-OFF, MILLING, TURNING AND DRILLING MACHINERY

ARMSTRONG



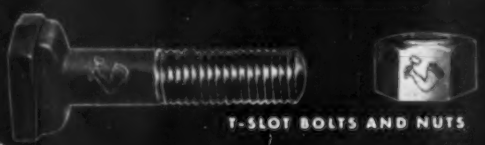
SET-UP AND HOLD-DOWN TOOLS

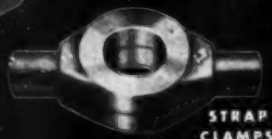
ARMSTRONG Set-up and Hold-down Tools reduce setting-up time—keep men and machines producing. Designed for use on planers, drill presses, milling machines, etc., they hold work securely and rigidly, and thereby reduce spoilage and prevent costly accidents.

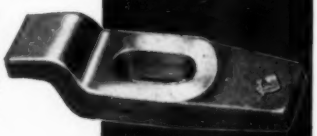
Your local Armstrong Distributor carries ARMSTRONG Set-up and Hold-down Tools in stock in sizes for every operation. Stop haphazard setting-up methods. Provide each of your machines with a full complement of ARMSTRONG Set-up and Hold-down Tools.

Write for Circular

Buy ARMSTRONG TOOLS from your Industrial Distributor







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PRODUCTION POINTERS from GISHOLT

More cost-cutting IDEAS— to help you

SUPERFINISH SAVES WALLINGFORD STEEL 1408 MINUTES PER PART

Setup saves $8,000 in grinding wheel costs

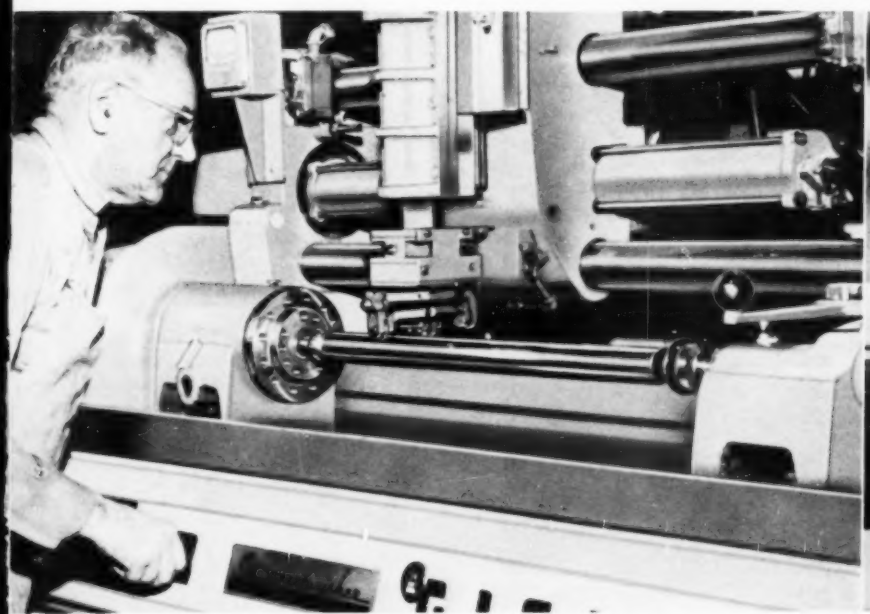
There isn't much to see in the illustrations—just the simplest kind of setup on a Gisholt MASTERLINE 52-A General-Purpose Superfinisher. But the savings that have been made for Wallingford Steel Company, Wallingford, Connecticut, are truly startling.

Wallingford Steel Company rolls stainless steel strip and special stainless alloys including tungsten, titanium and Stellite, used in the manufacture of cutlery, automobiles, etc. Solid carbide rolls are used to meet requirements for an ultra-smooth, highly reflective finished product.

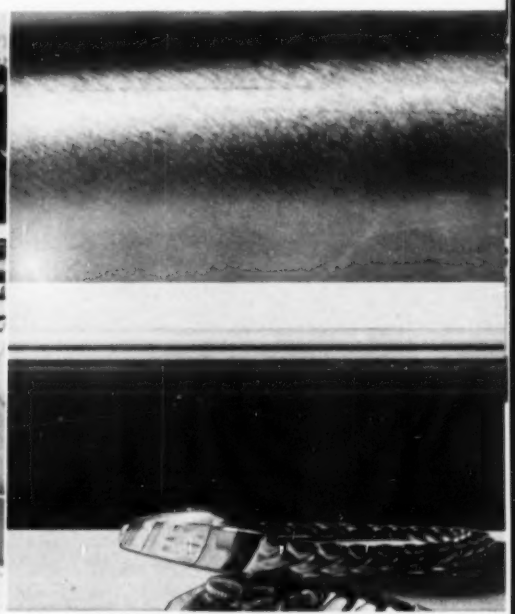
Previously, roughing and finishing rolls were ground using 600, 1500 and 2000 grit wheels, and then lapped to remove chatter and spiral feed marks left from grinding. Time, 80 minutes for grinding and 1440 minutes for four lapping passes taking six hours per pass. Total time, 1520 minutes.

Now the 52-A Superfinisher, equipped with a special high-speed oscillating head, a variable-speed drive and steady-rest support rolls, eliminates the entire lapping operation. In addition, only the 600 grit wheel is needed for rough grinding, reducing grinding time. This means an added initial saving of over $8000 because the costly 1500 and 2000 grit wheels are eliminated. Superfinish removes all chatter and feed spiral marks left from grinding. It provides a "controlled" surface finish of 8 micro-inches RMS on the roughing rolls and 1 micro-inch RMS on the finishing rolls. Time on the 29⅛" x 2½" roll shown is 32 minutes. After use, rolls are refinished, as required, in only 18 minutes. Even "built-up" material is removed.

Standard General-Purpose Superfinisher with special tooling saves 1408 minutes per roll. Steady-rest support rolls assure parallelism, .00050 concentricity. Inexpensive Superfinishing stones replace $8000 worth of special grinding wheels.



This simple setup on a low-cost general purpose machine saves 1408 minutes per part. Typical 29⅛" x 2½" solid carbide roll shown is Superfinished in only 32 minutes. Superfinished rolls produce same tonnage, operate at same mill speeds as lapped rolls previously used.



Roughing roll (top) Superfinished to 8 micro-inches RMS. Finishing roll (bottom) Superfinished to 1 micro-inch RMS. Note difference in reflectivity.

SETUP SPEEDS CRANKSHAFT BALANCING AT JOHN DEERE

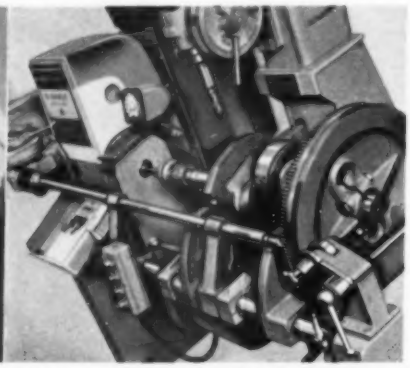
Unbalance measured, located, corrected, and inspected with one handling

Perhaps you can speed up your balancing operations by studying this setup used at the John Deere Waterloo Tractor Works, Waterloo, Iowa.

The workpiece is a John Deere 730 diesel tractor crankshaft, 21″ flywheel and counterweight assembly. A Gisholt 3S DYNETRIC Balancer is used with an end drive coupling to simplify handling. Two power drills mounted on the balancer, one vertical and one horizontal, correct unbalance by drilling at a 9″ radius in the 21″ flywheel and at a 6″ radius on the counterweight. A hand-operated thrust and centering device provides drilling support.

The operator assembles the crankshaft, flywheel and counterweight; places the assembly in the work supports; engages the end drive, and starts rotation. The direct reading amount meter is calibrated in terms of drill depth; so, the operator merely notes the angle and drill depth for each correction plane. Then he stops rotation. Unbalance is corrected in each plane by manually indexing the assembly to the observed angle and drilling to the exact depth shown on the amount meter. A simple calibrated dial on the drill feed handwheel assures accuracy. The assembly is rotated again for inspection. Unit numbers are stamped on each part; relative position markings are made, and the assembly is dismantled for storage. Total f.t.f. time, ten minutes —5.5 minutes of which is required for measuring, locating, correcting and inspecting for balance.

One 3S Balancer, requiring minimum floor space, combines all dynamic balancing operations. Here the operator corrects unbalance in left plane by drilling in counterweight using vertical drill spindle. Horizontal drill for correcting in flywheel, at left.



Close-up showing crankshaft, flywheel and counterweight assembly in 3S Balancer with end drive. Ten minutes f.t.f. time includes assembling, balancing, correcting, inspecting, dismantling and stamping of unit numbers, timing and location marks.

Direct reading amount meter, calibrated in terms of drill depth, speeds unbalance correction. Depth dial on drill feed handwheel assures accuracy. Setup cuts costs, saves time with all balancing operations completed in one handling.

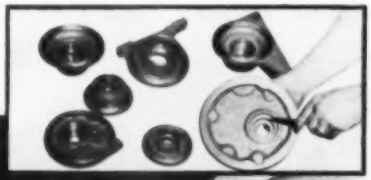
HOW MASTER ELECTRIC CO. CUTS "OFF-CENTER" BORING COSTS

Sliding faceplate on Fastermatic automatic chucker combines operations

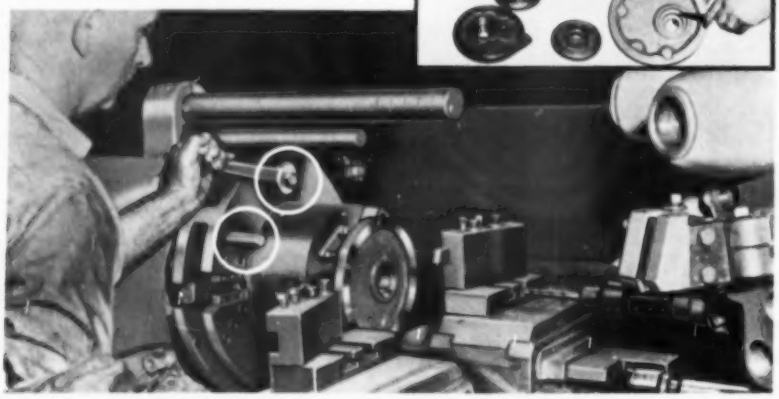
You will want to study this setup at Master Electric Company's Dayton, Ohio, plant. It combines "off-center" boring with standard turning and facing operations to eliminate extra handling and improve accuracy.

The workpiece, a cast iron gear cover, is held in a special faceplate fixture, chucking on a back hub and locating against a back face. With the part "on-center," tools on hex 1 turn the O.D. while front and rear cross-slide tools rough and finish-face. The cycle stops. The operator loosens a nut and grasps a handle (both encircled) on the faceplate fixture, pulling it "off-center" for the second phase. He tightens the nut and starts the automatic cycle. Other hex turret tools machine three different diameter bores. The two co-bores are relieved at the base, sized for depth and reamed. The intermediate co-bore is held to a 40 micro-inch RMS finish. F.t.f. time, 6.5 minutes.

Over 60 Fastermatics are in constant use at Master Electric Company's Dayton, Ohio, plant, completing over 150 motors per hour. They have proven ideal for efficient production of short-run, complex parts such as motor frames, gear covers, end bells, bearing housings, parallel heads, vapor-proof heads, etc.



One operator produces this variety of parts on the four machines he controls. Note gear cover at lower right. Operator indicates the three "off-center" diameters handled by sliding faceplate fixture.



After turning O.D. and facing part, cycle stops; operator loosens nut, grasps handle (both encircled) to move faceplate fixture over for "off-center" boring.

Fastermatic's automatic cycle permits one operator to handle four machines. Sliding faceplate fixture combines two operations in one chucking; assures accuracy, correct relationships between machined surfaces.

ASK YOUR GISHOLT REPRESENTATIVE ABOUT FACTORY-REBUILT

SMART SETUP ELIMINATES OPERATION FOR DRAPER CORP.

Standard machining and threading combined on Simplimatic automatic chucker

This setup cuts handling costs, improves accuracy and clearly shows how the Simplimatic's wide platen table offers great flexibility in arranging independent slides to machine a maximum number of surfaces in a single chucking. Draper Corporation, Hopedale, Massachusetts, takes full advantage of this feature in machining various sizes of cast iron threaded beam heads for textile equipment.

On a typical 26" diameter, narrow threaded beam head, work is held in a 32", three-jaw air chuck, locating at X, gripping at Y. Table feed is used to turn the O.D., engage three front slide rough-facing tools and center slide boring tools with the work. Table feed stops when front slide facing tools are to proper depth, and standard slide movements begin. Front slide feeds away from center, with three tools dividing the rough-facing cut. Piloted boring bar tools on the center slide finish the bore. Rear slide operates separately to finish-face and round front and back O.D. edges. After the finish-facing cut, the two-speed motor changes to low speed, and a tap and chamfering tool on the center slide boring bar threads and chamfers the bore. The tap collapses; the table and slides retract; the tap is automatically re-cocked for the next operation. F.t.f. time, seven minutes.

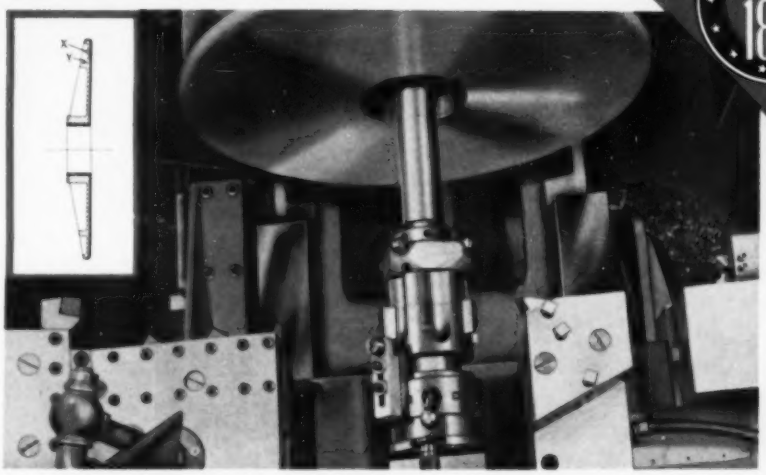


Photo shows tools retracting from work. Note how right combination of tools and slides on platen table permits standard machining and threading to be handled in one chucking.

Simplimatic's flat platen table cuts tooling costs, permits standard machining and threading on automatic chucker, saves extra operation. Two-speed motor provides correct surface speeds.

HOW CUTLER-HAMMER STEPS UP SMALL-PARTS PRODUCTION

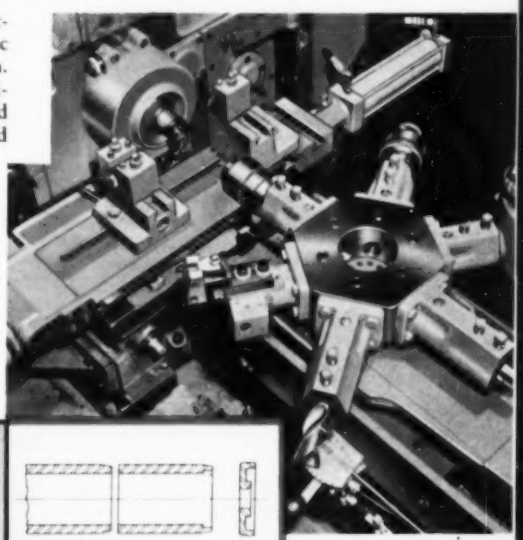
Hydraulic drive makes automatic chucker of ram type turret lathe

This setup at Cutler-Hammer, Inc., Milwaukee, Wis., shows how your costs can be cut on general machining work. Two typical jobs are covered, showing how a simple hydraulic drive control transforms a low-cost Gisholt No. 4 Ram Type Turret Lathe from a hand-operated machine into an automatic chucker.

The coil shield, shown at left, is made from 1¾" tubing; stock remains inside collet chuck for support while hex turret tools bore and chamfer I.D. Then stock is advanced to hex turret stop and rechucked. O.D. of the next part is beveled from the cross slide front and finished part is cut off from the cross slide rear. F.t.f. time, .7 minutes.

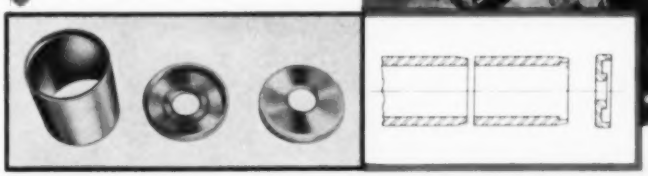
Cup washers, shown at right, are made from 2" bar stock; stock feeds to hex turret stop, collet chucks on O.D. Front cross-slide tools form rear O.D. radius and face front (see drawing). Hex turret tools complete all other surfaces, including chamfer at back of bore handled by special slide tool. Finished part is cut off from rear of cross slide. Cycle repeats. Time f.t.f., 1.77 minutes.

Hydraulic drive controls turret ram and cross-slide tools, spindle start-stop-reverse, speed and feed selections, reverse feed, and automatic collet chuck and bar feed operation. Operator loads bar stock and initiates first cycle. He removes finished parts and has time to handle second machine.

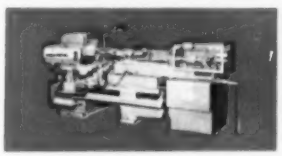


Tooling for machining cup washers. Part made from 2" bar stock with all 14 surfaces indicated on drawing handled in 1.77 minutes f.t.f.

Left—coil shield produced in .7 minutes f.t.f. from 1¾" tubing; right—cup washer produced in 1.77 minutes f.t.f. from solid 2" bar stock.



Operator productivity is greatly increased. Hydraulic drive provides low-cost automatic cycle, retains turret lathe flexibility for handling of wide variety of parts.



MACHINES WITH NEW MACHINE GUARANTEE

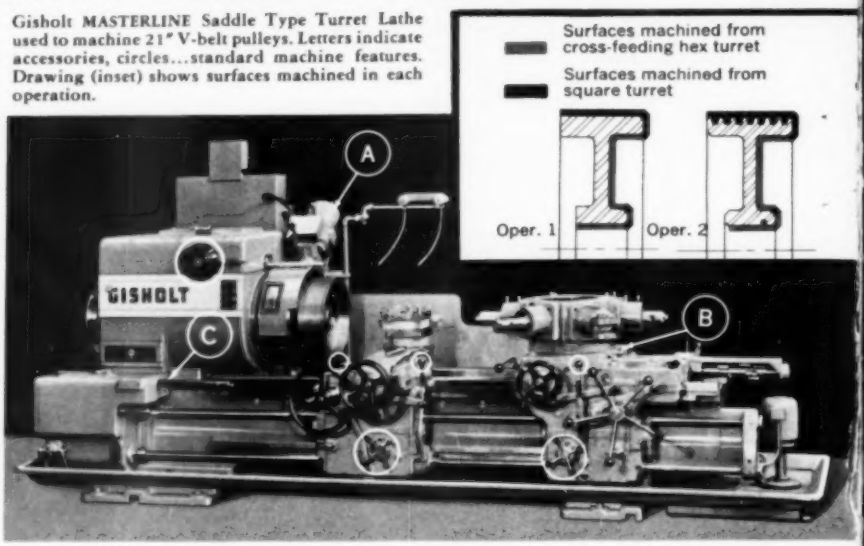
MASTERLINE GISHOLT SINCE 1887

HOW MACHINE FEATURES CUT PULLEY COSTS

Special stop bar speeds grooving; cross-feeding turret saves tooling

This setup shows how Gisholt MASTERLINE Saddle Type Turret Lathe features and accessories can cut costs on your job-lot work. The drawing at right shows how 21" semi-steel V-belt pulleys are machined in two operations on a Gisholt 4L. Work is held in a 24", three-jaw scroll chuck. Hex and square turret tools are used simultaneously on boring and turning cuts to save time. V-belt pulley grooves are single-tooled to eliminate distortion and to provide a finer finish. F.t.f. times: Operation 1—16.5 min.; Operation 2—23.2 min.

Gisholt MASTERLINE Saddle Type Turret Lathe used to machine 21" V-belt pulleys. Letters indicate accessories, circles...standard machine features. Drawing (inset) shows surfaces machined in each operation.



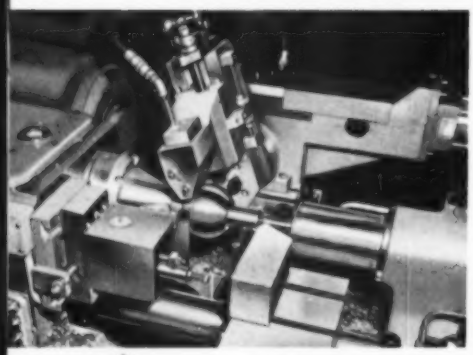
Here's how accessories cut costs: *Power Chuck Wrench* (A) adjustable chucking pressure minimizes distortion; reduces operator fatigue; assures quick, accurate chucking. *Cross-Feeding Hex Turret* (B) permits standard, lower cost tooling; handles straight boring, chamfering, cross-facing and recessing cuts that, on a fixed center machine, would require slide tools or special tools. *Special Stop Bar* (C) accurately spaced notches speed cross-slide carriage positioning for grooving.

Accessories plus standard Gisholt machine features (encircled) such as *Hydraulic Speed Selector* for fast *direct* or *pre-set* speed changes, direct-reading feed dials, separate rapid traverse levers for cross slide, cross-slide carriage and hex turret carriage—all add up to faster production, reduced costs, less operator fatigue on both simple or complex jobs.

Rugged construction, versatility, faster setup, simpler operation make Gisholt Heavy-Duty Saddle Type Turret Lathes particularly adaptable, and PREFERRED, for all types of heavy-duty turret lathe work.

ROCKWOOD SPRINKLER CUTS SPHERICAL TURNING TIME 50%

Spherical turning head, variable-speed motor save time, improve accuracy and finish



Spherical turning unit generates O.D. on wide range of parts. Tools on front carriage and headstock-mounted auxiliary slide finish-form both ends of bore, blending with spherical O.D.

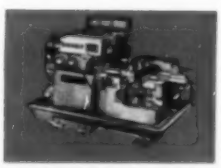
Looking for a fast way to generate an accurate, smooth, spherical O.D. on stainless parts? Take a tip from the method Rockwood Sprinkler Company, Worcester, Massachusetts, uses for handling stainless valve ball forgings on a Gisholt No. 12 Automatic Chucking Lathe.

Special tooling includes a spherical generating unit mounted on the bed behind the spindle, a headstock-mounted front auxiliary slide and a variable-speed motor for uniform surface speeds on increasing and decreasing diameters. The generating head is positioned by hand with micrometer adjustment and adjustable positive stops for separate roughing and finishing tools.

The workpieces, previously bored on the same machine, are held on an expanding mandrel with tailstock support. The spherical generating head roughs the O.D. in three passes. On the fourth pass the finishing tool is used to provide a 90 micro-inch RMS finish and to hold the .002" O.D. tolerance. During the finish cut, the front carriage feeds longitudinally, actuating the auxiliary slide, so that both ends are finish-formed at the same time. Time f.t.f. on the 6" ball shown is 32 minutes.

Spherical turning method provides smoother finish, greater accuracy; simplifies machining. Seven different sizes handled with minimum change-over. Variable-speed motor provides constant surface speed, longer tool life.

Typical parts handled with this setup. Left to right: after boring; 6" ball (16 pounds of stock removed in O.D. turning operation, 1⅛" stock per side); 3" ball (3 pounds, 8 ounces removed, 1⅛" stock per side); 2" ball (2 pounds, 6 ounces removed, 1⅛" stock per side).



No. 1-259
725

The Gisholt Round Table represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

Printed in U.S.A.

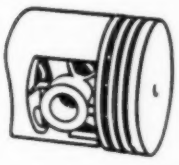
GISHOLT MACHINE COMPANY Madison 10, Wisconsin

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Machines • Packaging Machines • Masterglas Molded Plastic Products

POSITIVE DUPLICATION – EVERY TIME!

(PD)° Exact duplication of one person's fingerprints by another person is impossible. Discovery of this amazing fact in 1891 changed the science of detection and identification throughout the world.

But Positive Duplication of grinding wheels by the CINCINNATI (PD) manufacturing process is a remarkable fact also . . . time after time!



Every time you reorder the centertype wheel shown above, which grinds this automobile piston, that CINCINNATI (PD) wheel will act and grind exactly like the original . . . saving you time and money, and maintaining your production.

This is true of *any* CINCINNATI (PD) WHEEL you specify: centertype, centerless, internal, surface, toolroom, and snagging wheels.

Another advantage for you is that every factory representative is a highly trained specialist in grinding machine set-ups and operations. For his help on those extra-tough grinding problems, see your CINCINNATI (PD) Grinding Wheels Distributor or contact Cincinnati Milling Products Division, Cincinnati 9, Ohio.

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GRINDING WHEELS

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A PRODUCTION-PROVED PRODUCT OF THE CINCINNATI MILLING MACHINE CO.

NOW MORE THAN EVER

MARVEL HIGH SPEED EDGE HACK SAW BLADES

should be YOUR FIRST CHOICE

This is no time for "second-best" performance from your hack sawing machines. Today, every cut you make on a hack saw should be done as quickly, accurately, and economically as possible.

The *blades* you use can often mean the difference between mediocre work and top performance from your hack sawing machines. Here are 3 big advantages unbreakable MARVEL High-Speed-Edge Hack Saw Blades can bring to your cutting-off operations:

1 HIGHER PRODUCTION . . .

MARVEL High-Speed-Edge Blades are shatterproof and can be worked harder and faster than any other blade. They will withstand the highest speeds and heaviest feeds attainable on any hack sawing machine with complete safety. Machine operators working with MARVEL Blades naturally apply greater tensions, feeds, and speeds because they know they are safe from personal injury accidents. The result is faster cutting-off.

2 GREATER ACCURACY . . .

MARVEL Blades can be safely tensioned from 200% to 300% more taut than ordinary blades. Higher blade tensions produce greater rigidity of the high-speed-steel cutting edge, resulting in maximum attainable accuracy of cut-off blanks.

3 LONGER BLADE LIFE . . .

Each MARVEL High-Speed-Edge Hack Saw Blade is triple tempered to assure maximum toughness of the cutting edge. MARVEL Blades not only give you longer life, they assure a more efficient cutting life and lower blade costs.

Why gamble? Demand MARVEL Blades by name, and be sure you're getting the best blades on the market. Leading Industrial Distributors have them in stock.

B-1123

Write for the new MARVEL Cutting Tool Bulletin and the name of your nearest MARVEL Distributor.

ARMSTRONG-BLUM MFG. CO.
5700 BLOOMINGDALE AVE. • CHICAGO 39, ILLINOIS

MARVEL Metal Cutting SAWS
Better Machines—Better Blades

INNOCENTI

milling and boring machine INNOCENTI C.W.B

INNOCENTI CORPORATION

NEW YORK 23, N.Y. - Tel. Columbus 5-7795

The Innocenti CWB milling and boring machine allows the solution of the most difficult working problems in the most rational way. This is achieved thanks to the exceptional performances of the machine and to the variety and flexibility of the equipment used with the machine. The face plate of the headstock is patented and is especially designed for the application of a large range of interchangeable heads for any working requirement. Our technicians besides the standard types are in a position to study for you the unit that can accomplish the outmost economy in the most difficult stage of your working operations. Examples of standard equipment: (1) 8 spindle turret head. (2) Head for machining diesel engine and moto-compressors. (3) Universal head. (4) Head for machining turbines. (5) Head for machining rotor slots. (6) 3 way head.

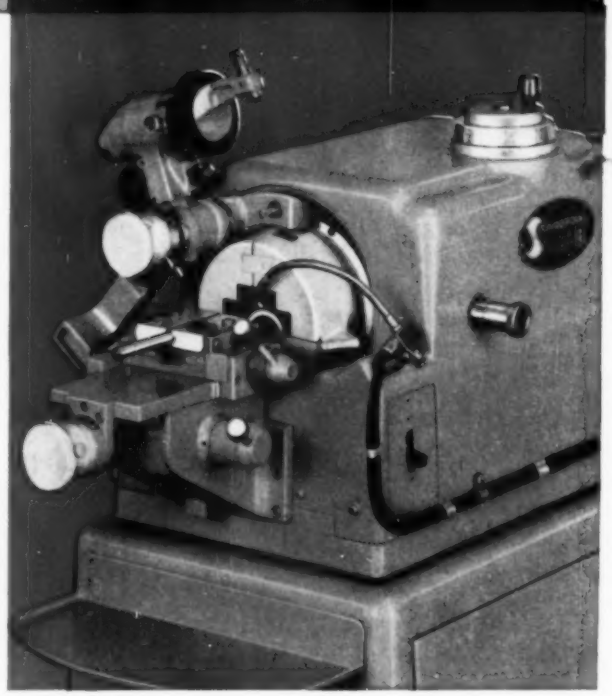
production — High accuracy — great flexibility — maximum

bertani f 2 58

REDUCE DRILLING COSTS...

INCREASE HOLE ACCURACIES

RIGHT NOW!



. . . with your own standard twist drills sharpened to SPIRAL POINT — Cincinnati's new drill point geometry.

Drill PRECISION holes with Spiral Point **—all the way up to 1" diameter.**

Get accurate hole size . . . straighter, rounder, cleaner holes . . . and you eliminate secondary operations. Maintain hole-positioning accuracy without costly guide bushings or precentering. Get more holes per grind.

CONVERT

the twist drills in your plant to *precision Spiral Points* with the new Cincinnati SPIROPOINT® DRILL SHARPENER. It automatically applies this cost-saving geometry in a matter of seconds.

IMMEDIATE DELIVERY
on sizes to 1"

Improved Machining Through Research

CINCINNATI LATHE AND TOOL CO.

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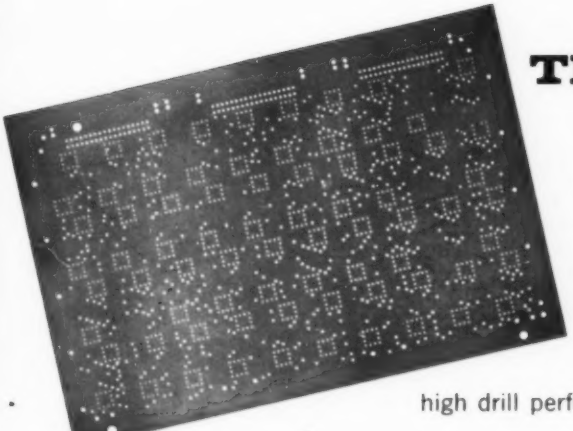
"TRAY-TOP" Lathes / "CINCINNATI" Drilling Machines / "SPIROPOINT" Drill Sharpeners



On some plates such as this one, up to 1014 holes are drilled on one pass!

The odds are 579 to 1

Those are the odds on each drill in this setup at Burroughs Corporation's Tireman Plant in Detroit. When a 3/32" circuitry panel of Epoxy glass, copper clad .0014" both sides, contacts these 580 "Greenfield-Ampco" drills, failure of any one drill would offset the efficiency of the other 579 on that pass. And each pass carries the same odds! So a job like this demands not only high drill performance, but highly uniform performance as well.

GREENFIELD TAP & DIE

GREENFIELD, MASSACHUSETTS

BUY FROM YOUR **GREENFIELD DISTRIBUTOR** FOR SERVICE AND QUALITY

The old heave-ho helped to develop strong men in granddad's day – but "cricks" in the back and smashed toes were as common as "rheumatis".

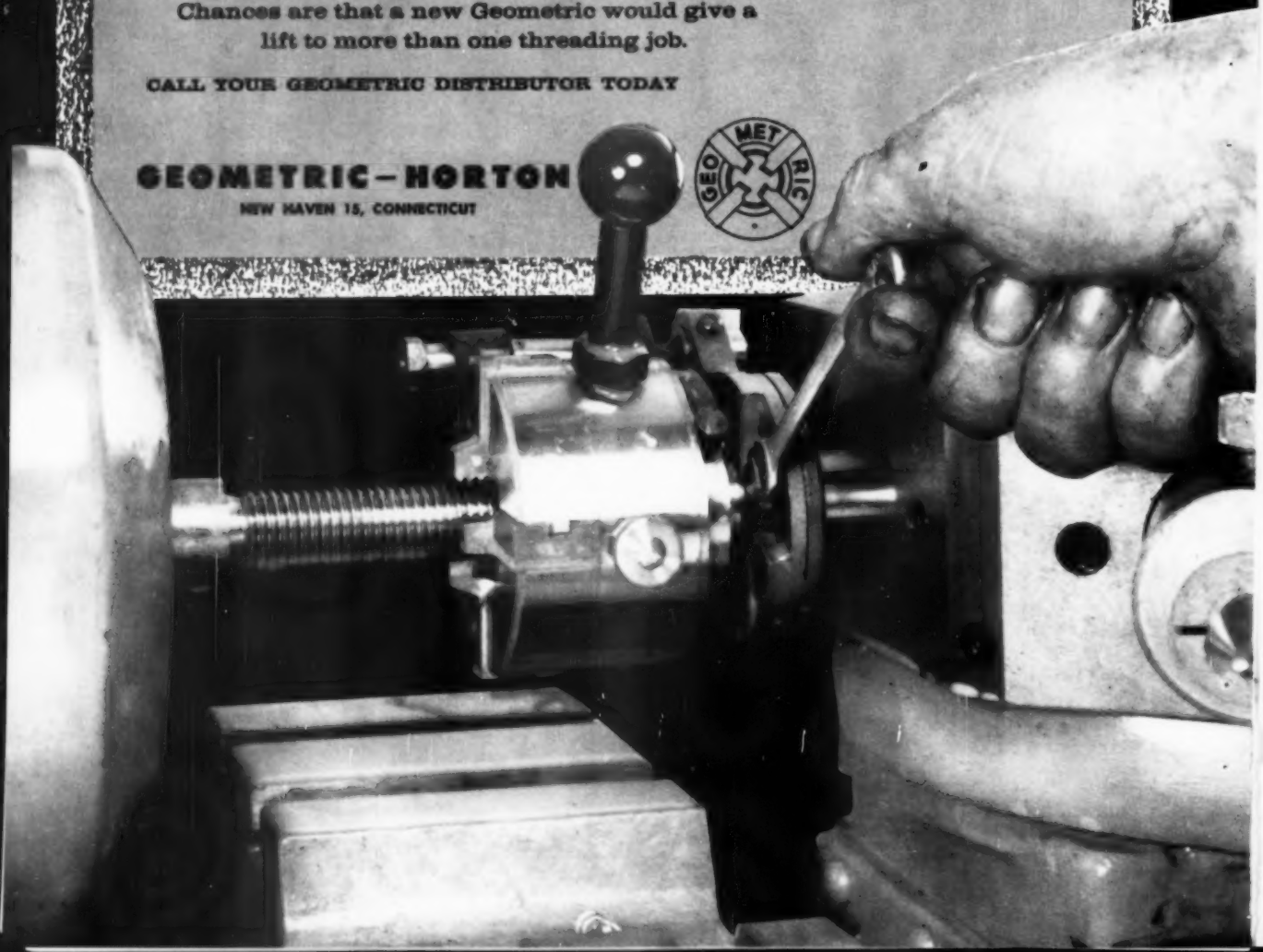
Who wouldn't prefer to ride a power loader, lift tons and feel safe all at the same time?

Look around your plant, you'll probably find nobody toting those bars and lifting those bales but be sure you are not trying to produce today's precision threads with antique or worn out die heads. Chances are that a new Geometric would give a lift to more than one threading job.

CALL YOUR GEOMETRIC DISTRIBUTOR TODAY

GEOMETRIC – HORTON

NEW HAVEN 15, CONNECTICUT



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ELMIRA, N.Y.

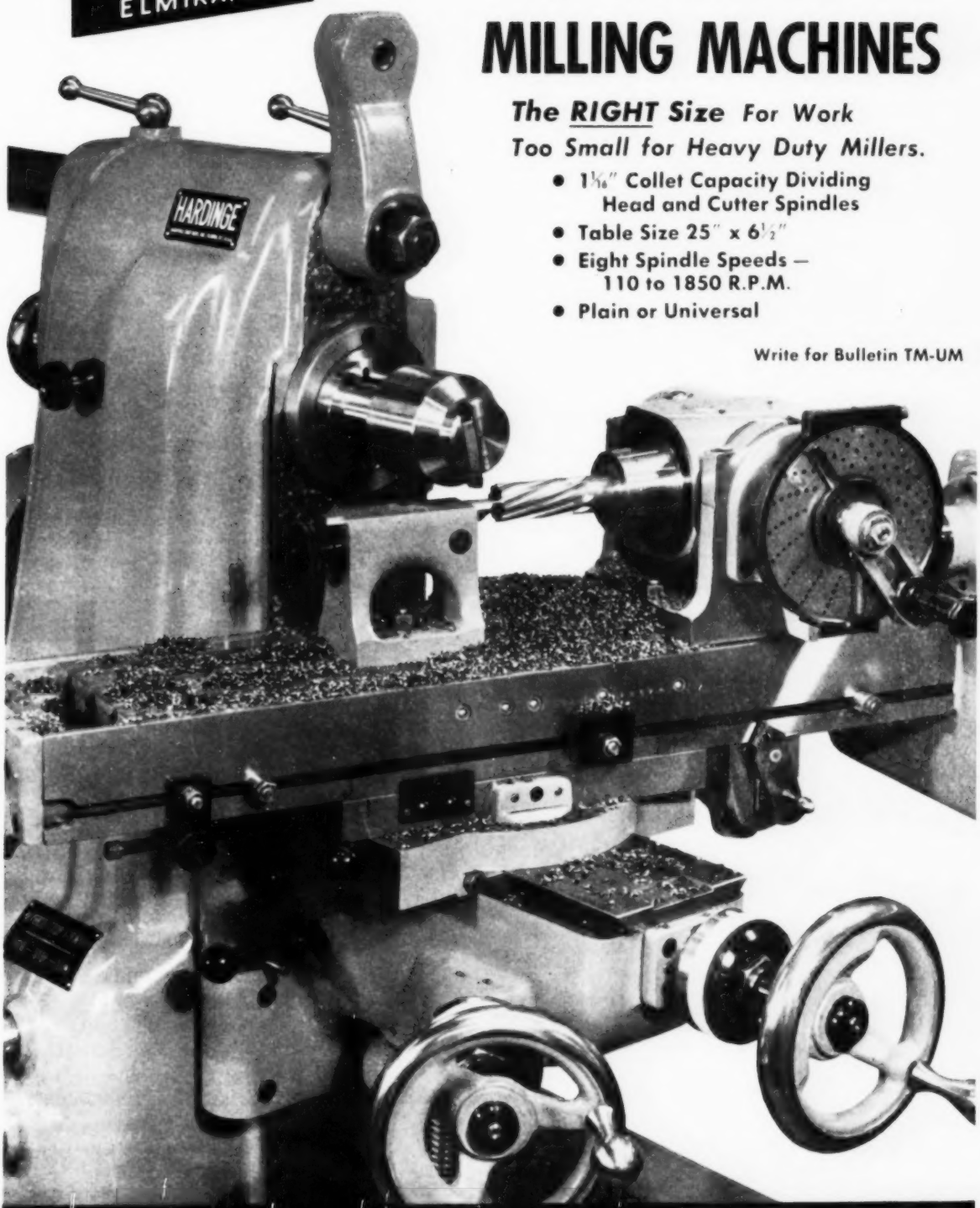
High Speed Precision

MILLING MACHINES

***The RIGHT Size** For Work*
Too Small for Heavy Duty Millers.

- 1 1/16" Collet Capacity Dividing Head and Cutter Spindles
- Table Size 25" x 6½"
- Eight Spindle Speeds — 110 to 1850 R.P.M.
- Plain or Universal

Write for Bulletin TM-UM



HARDINGE BROTHERS, INC., ELMIRA, N. Y.

OFFICES IN PRINCIPAL CITIES. EXPORT OFFICE 269 LAFAYETTE ST., NEW YORK 12, N. Y.

◀ CIRCLE 140 READER SERVICE CARD

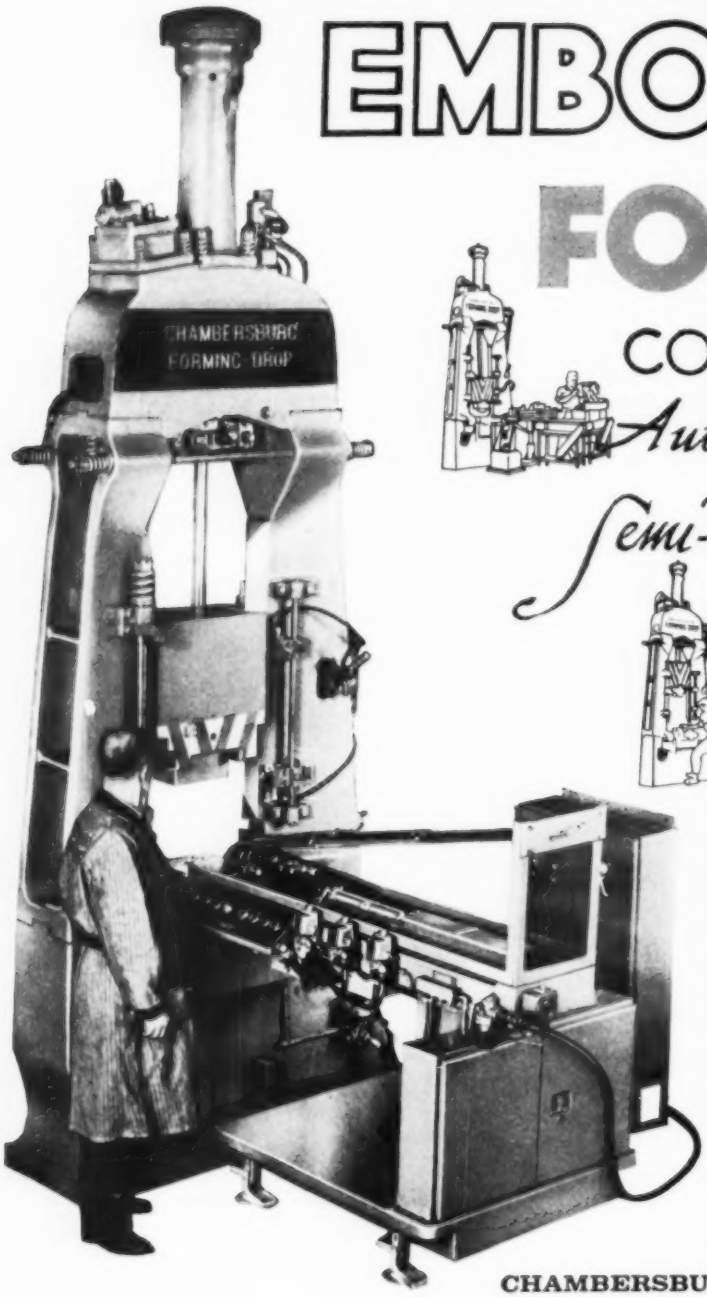
CIRCLE 141 READER SERVICE CARD

COINING
EMBOSSING
FORMING
COLD STRIKING

Automatically

Semi-automatically

Manually



The new Chambersburg Forming Drop meets the demand for an accurate, high production hammer for coining, embossing, forming and cold striking. The impact blow, which minimizes springback, can be precisely adjusted to suit particular job requirements. Electric controls permit the use of versatile feed devices increasing operator safety and efficiency.

A Chambersburg representative will be glad to show you a film depicting this new production method. Phone or write for further details.

CHAMBERSBURG ENGINEERING COMPANY
CHAMBERSBURG, PA.

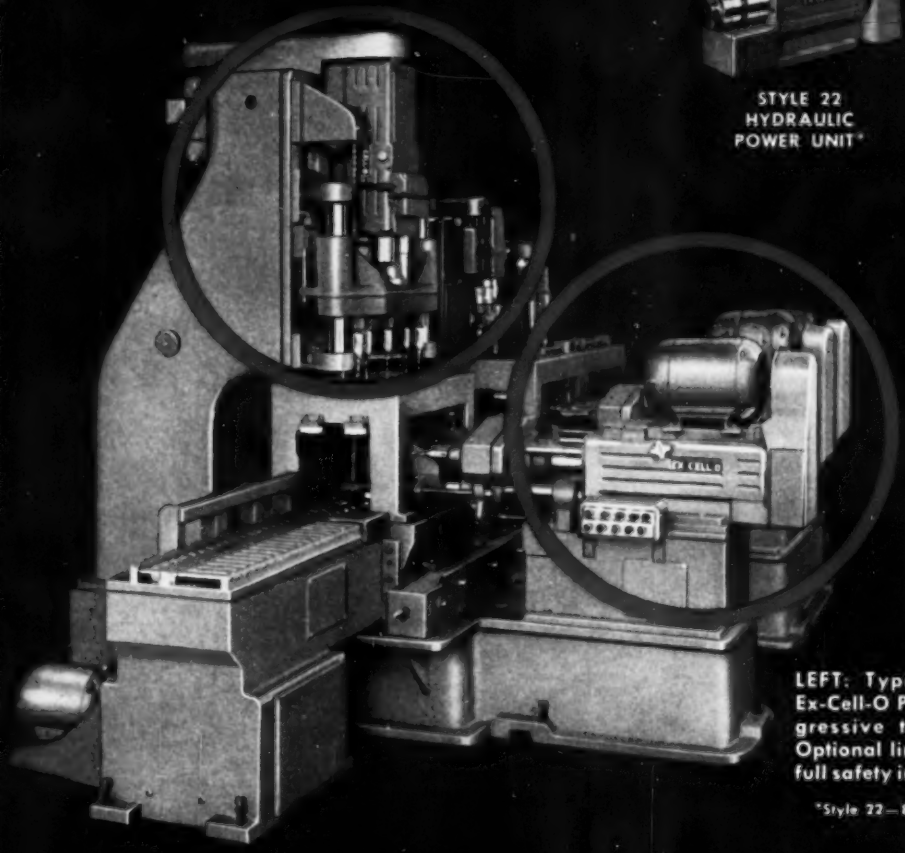
CHAMBERSBURG
FORMING DROP

XLO EX-CELL-O FOR PRECISION

STYLE 22
HYDRAULIC
POWER UNIT*

STYLE 28-A
HYDRAULIC POWER UNIT

STYLE 20
HYDRAULIC POWER UNIT



LEFT: Typical application shows six Ex-Cell-O Power Units installed on a progressive transfer-type machine tool. Optional limit switch assemblies provide full safety interlock and start-cycle control.

*Style 22—8-inch Stroke; Style 22-L—12-inch Stroke

POWER + VERSATILITY

58-11

With Ex-Cell-O Quill-Type Hydraulic Power Units

Why buy a power unit that's made to do just one job—when a single, low-cost Ex-Cell-O Hydraulic Power Unit will do more work in a broad range of applications?

Compact Ex-Cell-O Power Units are used for drilling, spot-facing or reaming in special-purpose machines. When these operations are no longer desired, the units can be quickly and easily relocated to perform numerous other operations.

Because of their simple, precise control in automatic cycling, they've even been used in light, high-production broaching, material handling and many unrelated operations.

Ex-Cell-O Hydraulic Power Units are self-lubricated, perform in fast cycles, and are easy to install, particularly where space is at a premium.

For complete information on Ex-Cell-O Quill-Type Power Units, and how they can lower your production costs, call your local Ex-Cell-O Representative or write direct.

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN
Machinery Division

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • TORQUE ACTUATORS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

CIRCLE 143 READER SERVICE CARD

Howard Beacham tripled wheel life,

Howard Beacham has been a Bay State Abrasive Engineer for fifteen years and his total experience is double that. He's worked on grinding problems that have involved every type of metal in jobs as tiny as miniature bearings and as big as the world's largest air compressors and steam turbines.

cut dressing frequency in half at New Process Gear

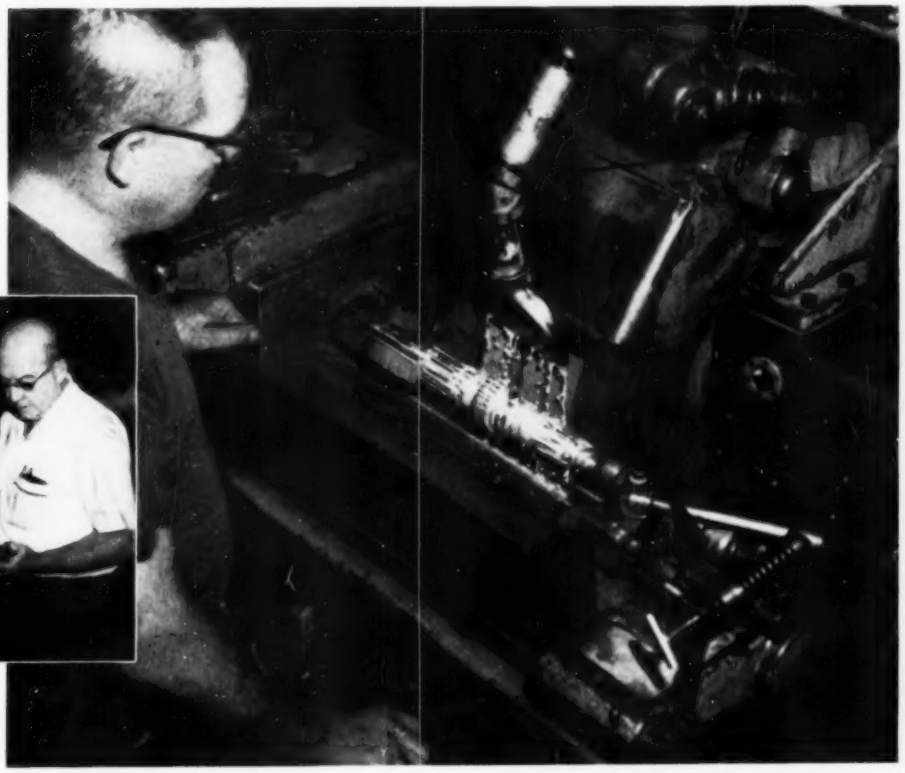
The closer you get to automation, the more it hurts to have production interrupted. That was the principal problem at Chrysler's New Process Gear Division where semi-automatic grinding of flats on truck transmission shafts was halted by wheel dressings every eleven pieces.

The three competitive wheels used in this simultaneous "cam grinding" operation wore down so fast they had to be replaced every week. And, on top of that, an alarming number of shafts were being cracked during the grinding operation.

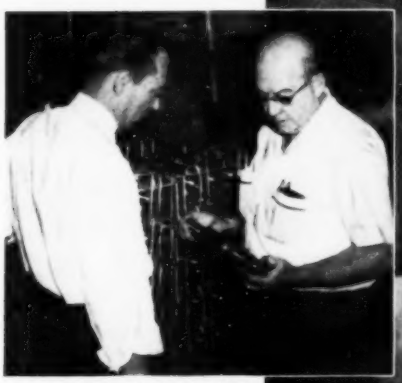
Bay State's Howard Beacham was called in on the job. He specified a trio of Bay State wheels that produced really spectacular results.

Production jumped to twenty-five perfect shafts per dressing and wheel life went up to three full weeks. Finish was excellent, too.

Why not talk to your own Bay State representative next time you have a grinding problem? Like Howard Beacham he's a trained specialist. *Better grinding at lower cost . . . that is his business.*



Operator Henry Kotas runs grinder equipped with one 24 x 1-21/32 x 12 and two 24 x 1-3/4 x 12 Bay State wheels. The three wheels simultaneously grind flats on main shaft for 5-speed truck transmission.



(*Above*) Manufacturing Engineer Wiley Bell and Plant Superintendent Nelson Fisk examine finished truck transmission shaft.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

MATTISON
HIGH-POWERED PRECISION
GRINDING METHODS

New Quick-Tilt© spindle can increase your grinder production 50%

Converts from roughing to finishing in seconds

Until now, users of vertical-spindle surface grinders have had to compromise either accuracy or production because of the difficulty in tilting the wheel spindle. In fact, to combine high stock removal with fine finish and flatness meant paying for two operations instead of one.

Now it is possible to tilt the spindle by just turning a selector switch. You have power-tilting to eliminate wheel drag when roughing, yet in a matter of seconds the grinding wheel can be reset to the flat position for finish grinding.

Simple, isn't it? You might even ask: "Why didn't you think of this ten years ago?" Actually, the real significance of this feature lies in the new thinking about surface grinding as a stock removal operation. Ten years ago grinding was considered a finishing process. Therefore, it was not until we had proved the direct and indirect cost savings made possible by grinding from the rough that the need for power-tilting spindles became imperative.

Production tests in our Methods Laboratory show that the average grinding operation can be at least 50% more efficient—that's comparing one machine with the wheel set flat against one on which the cycle is divided between roughing and finishing. But, the profit significance of power-tilting shows up more dramatically when ***grinding*** through outer scale and burned edges instead of milling or planing.

How to increase stock removal

With a tilted spindle your motor horsepower is applied over a smaller wheel area for greater grain penetration. This produces a bigger chip. You can use harder wheels and still get breakdown.

Fig. 1—Turning the selector switch automatically tilts the spindle .010 in. toward the leading edge, or back to dead flat.

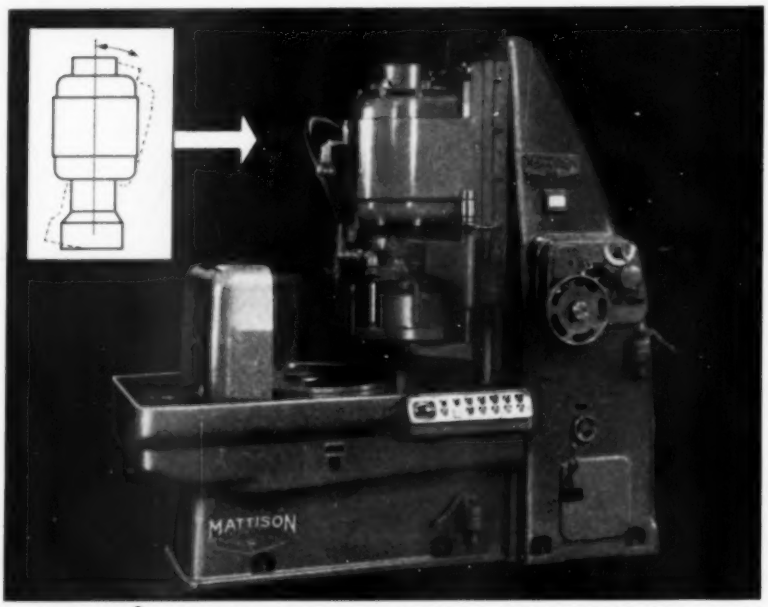


Fig. 2—Quick-Tilt© spindles solidify all the accuracy and stock removal features built into Mattison No. 24 and 36 rotaries. These machines are being built with spindle motors up to 60 hp to provide optimum cutting speeds on stock-removal operations.

With modern casting and forging techniques, there is no reason why stock allowances should not be specified for rough grinding of flat surfaces. This means a saving of approximately 50% of the stock allowance normally required for tool or cutter finishing. If close tolerances or finish are requirements, think of the dual advantages by grinding.

Hard spots, scale, and burned edges are no problem. We can show you examples of savings on parts such as bolster plates, forging dies, pump castings, and forged steel chain links.

Increases accuracy of small parts

With the practical elimination of curvature during the finish grind, more small parts can be ground per table load and setups can be speeded because the work need not be centered in relation to the wheel "ellipse." You use the same, easily adjusted clearance for every job. Leave enough stock for finishing and it is possible to grind over the full diameter of the wheel and still hold precision tolerances on all parts whether they're located at the outer edge or under the low point.

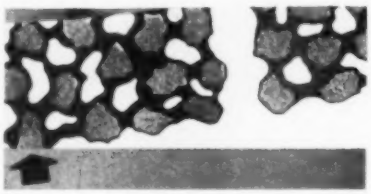


Fig. 3—Tilting the spindle reduces contact area between segments and work, permits use of higher horsepower and harder wheels. Slight bevel at leading edge reduces contact area for finishing.

See a demonstration

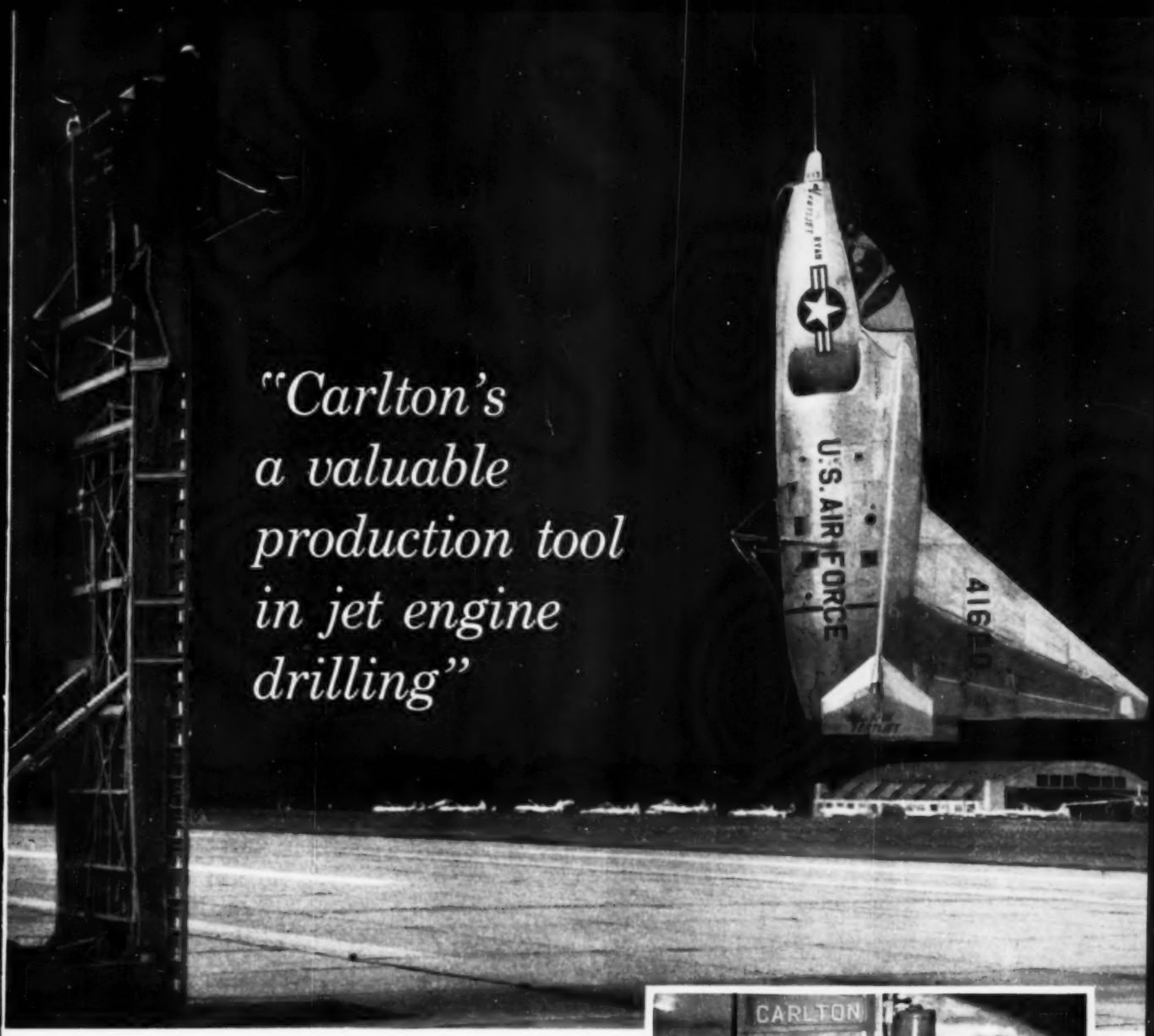
We are producing perfect diamond finishes on parts having large, uninterrupted surfaces. We can show you production savings, wheel life, and accuracy on test jobs or your own. Your Mattison dealer will make all the arrangements.

MATTISON MACHINE WORKS
Rockford, Illinois Phone 2-5521

Want more information? Send for new catalog describing Quick-Tilt spindle and other exclusive features of Mattison's Nos. 24 and 36 vertical rotary.

MATTISON MACHINE WORKS

HIGH-POWERED PRECISION SURFACE GRINDERS



"Carlton's a valuable production tool in jet engine drilling"

Robert L. Clark, Works Manager, Ryan Aeronautical Co., San Diego, has supervised the production of hundreds of Ryan jet engine structures like the sensational Vertijet shown above. He says:

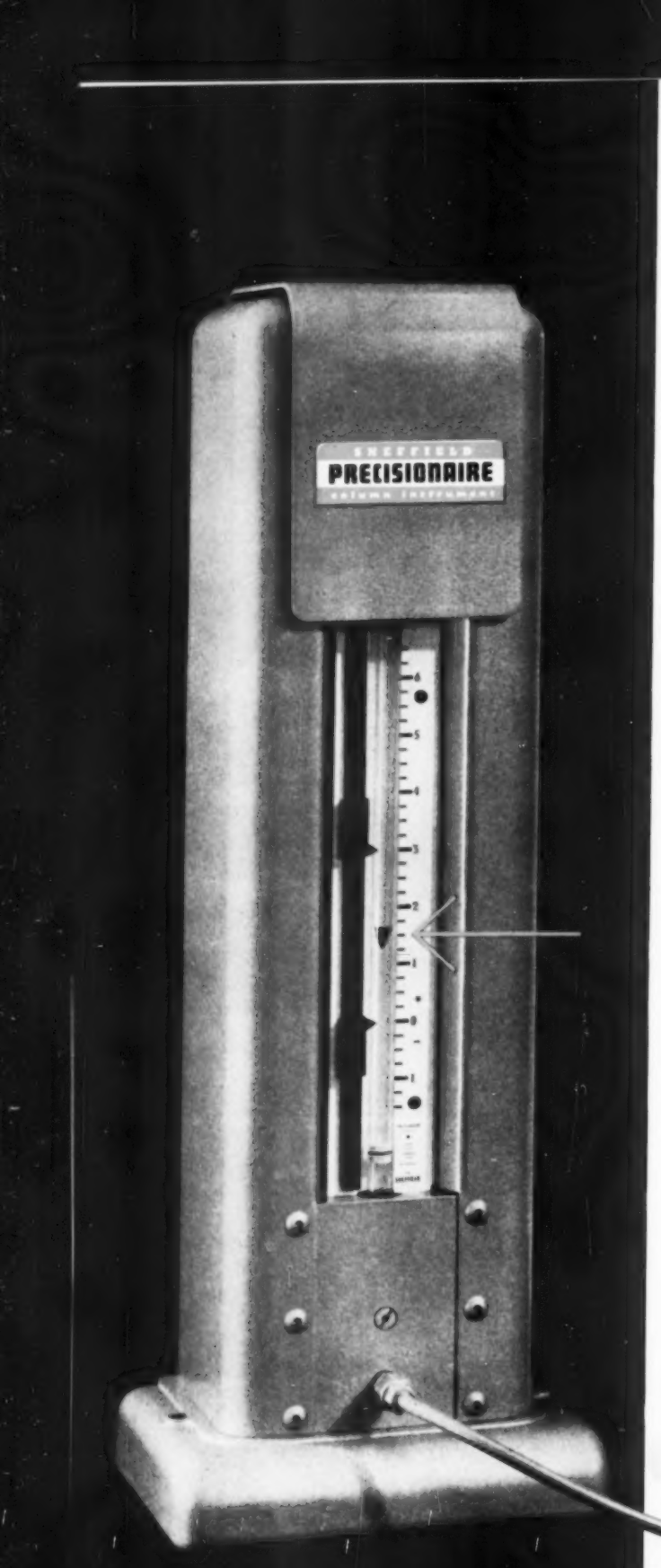
"Carlton is the kind of radial drill you can count on for production hole drilling like the jet engine H-ring (below)."

It will pay you to investigate Carlton radial drills for *all* your drilling and boring requirements. Unlimited choice of arm and column sizes and the most modern programming-preselect speed-feed control systems. Write for descriptive bulletins. The Carlton Machine Tool Co., Cincinnati 25, Ohio.

Carlton 3A Radial drills and reams 200 holes in the H-flange of this Ryan jet engine component.

Carlton ... *specialists in Radial Drills*

CIRCLE 147 READER SERVICE CARD



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Precisionaire®: the gage that always works.

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The Sheffield Precisionaire® gage is the most accurate, most dependable, most widely accepted air gage money can buy. Here's proof:

There are more Precisionaires in use than all other air gages combined.

Of the nation's 500 largest companies, every one engaged in precision manufacturing uses Sheffield. Only Sheffield offers these advantages:

Precision built into instrument

Amplification and linearity are built into the glass float tube permanently—immune to "hidden drift" and misadjustment. Amplification is entirely pneumatic, linear over the full 8" scale, even for dimensions smaller than .185". Scale is the longest available anywhere. A Precisionaire is ready to go without warm-up.

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Only Sheffield lets you select the amplification you need from 50:1 through 100,000:1 or greater. When your requirements change, you convert to another standard amplification in 2 minutes with an inexpensive kit. A Precisionaire stays new.

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The only moving part—the float—is suspended in a column of filtered air. This illustrates the design simplicity, inherent proof that a Precisionaire never wears out. You can depend on accurate, repeatable dimensional readings day-after-day, year-after-year no matter how often your requirements change.

Choose gaging elements you need

Only from Sheffield can you select the **exact** size sensing element you need from the broadest inventoried line available. Your complete Sheffield gaging system carries a single nameplate guarantee and is backed by a coast-to-coast network of gaging centers.

Unskilled people read it faster

Simple two-master setting is **always** reliable and is the only **proven** way to compensate for every operating variable. Tolerance display is as great as desired. Bold, clear markings read directly in fractions of an inch, without parallax. Gage response is virtually instantaneous even when the part is remotely located. You check multiple dimensions with one quick eye-sweep over compactly grouped columns. Computing circuits eliminate "figuring" on complex multiple checking.

Sheffield knows air gaging

During 18 years of leadership, Sheffield has simplified, refined and polished air gage design for maximum accuracy and reliability. A reason you can depend on Sheffield recommendations is that Sheffield makes **every** type of dimensional indicating gage—pneumatic, electronic, electric and optical-mechanical. Your **needs alone** form the basis of a proposal.

Write for catalog

Find out now about the dollar advantages of Sheffield air gaging systems. Contact your Sheffield gage engineer through your Yellow Pages, or write direct for Catalog No. AGS-1-59

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of Bendix Aviation
manufacture and measurement for mankind

CIRCLE 149 READER SERVICE CARD

spotlighting

A TREMENDOUS TRIFLE

Previous contact tube design depended entirely on wire cast for limited contact; uncertain current pickup resulted. New-Longitudinal wires, brazed at one end, act as a chuck to insure positive contact.

. . . that dramatically improves the arc stability of your Aircomatic® equipment

Physically, this new contact tube with "floating Chuck" is just a trifle—a simple set of hardfaced "wiping" wires** inserted in the contact tube barrel of your Aircomatic gun. But it gives positive, multiple contact with the welding wire at all times.

It ends interior arcing, prevents burnback, galling, insures good current pickup, increased current capacity and stable arc performance—on Aircomatic welding guns.

The new wiping action contact tube is available in various diameters for the Aircomatic MIGet*, the Aircomatic Pull gun, the Aircomatic push gun (except heavy-duty), and the AMHB Aircomatic head. Optional equipment on all new guns. For complete information, contact your Airco office.

Welding wire leaves the barrel through a nest of longitudinal wires. Wiping action assures stable arc performance even with aluminum and magnesium wires.

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82% time saved . . .

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Production increased 200%

Shown is 90° COPYMATIC Lathe with 4-Way Power Rapid Traverse, (optional extra). 45° COPYMATIC and Powershift Preselector headstock also available.

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LOOK AT LODGE & SHIPLEY FIRST!

More production at lower cost is the answer to constant upward pressure on prices. Savings proved in Lodge & Shipley case histories* show the wisdom of investigating *and* buying a Lodge & Shipley POWERTURN Lathe as a profitable replacement.

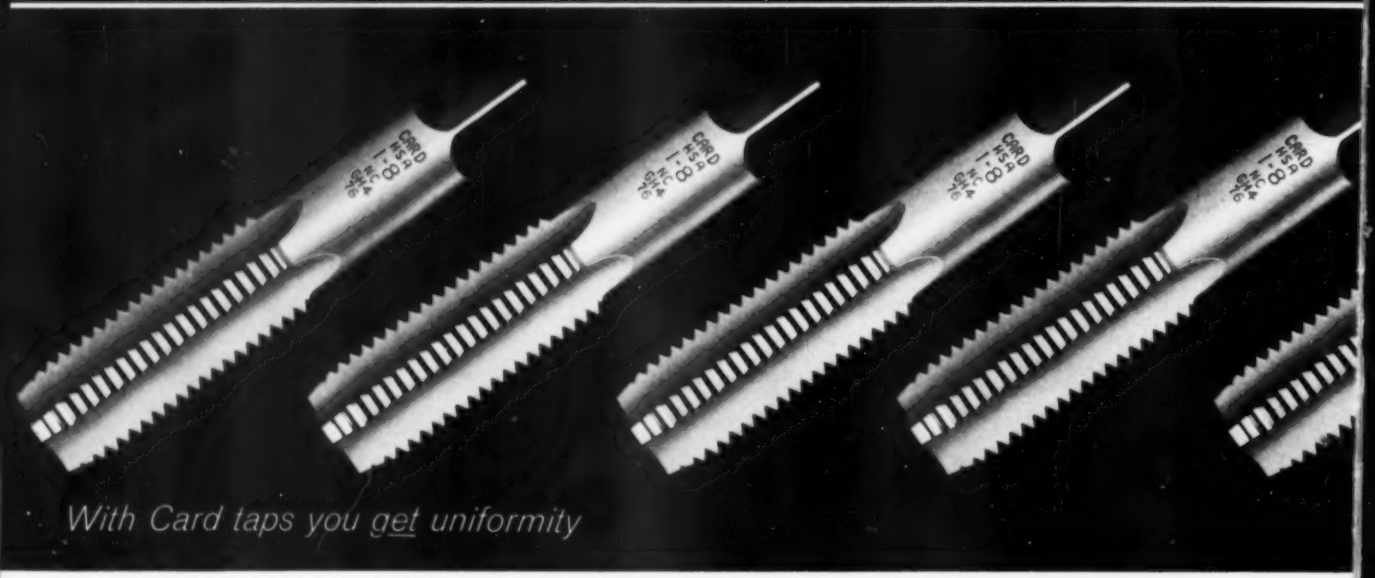
Production requirements change. The lathe purchased just a short time ago may not be adequate . . . judged by today's production, accuracy and economic standards. Details in Sweet's Machine Tool File; contact local representative through Yellow Pages or write direct for case histories and Bulletin No. L-103:

The Lodge & Shipley Co., 3056 Colerain Avenue, Cincinnati 25, Ohio.

*Names and details on request.

Lodge & Shipley

When you see uniformity, remember . . .



With Card taps you get uniformity

Your production's consistent ...because Card taps are uniform

Keeping production up to par calls for cutting tools that perform correctly whenever used — and are exactly alike, whenever reordered. You're sure of these advantages with Card taps, because each is identical with every other of the same type and size. Shopmen everywhere know this—have been shown by Card technical men how the uniformity of Card taps and gages is predictable and profitable. S. W. CARD DIVISION, Mansfield, Mass. Card Warehouses: Atlanta, Chicago, Detroit, Fort Worth, Los Angeles, New York, San Francisco.

The CARD Quality

CARD

DIVISION OF UNION TWIST DRILL COMPANY

— Serving you through the best distributors from Coast to Coast

CIRCLE 152 READER SERVICE CARD

If you use drills as much as missiles use fuel . . .

Ordering Union drills will cut your production time and costs

The more you use drills the more you need Union

To make sure you save — considerably and constantly — on all your drilling jobs, remember: You have a broad selection of standard types of Union drills to choose from. In plants throughout the country Union technical men have proved that the time and costs of many production operations can be reduced with Union drills, milling cutters, gear cutters, end mills, reamers, hobs, carbide tools and inserted blade cutters. **Available nationally through Union Distributors** and stocked in Union warehouses in Atlanta, Chicago, Detroit, Fort Worth, Los Angeles, New York City and San Francisco.

UTD

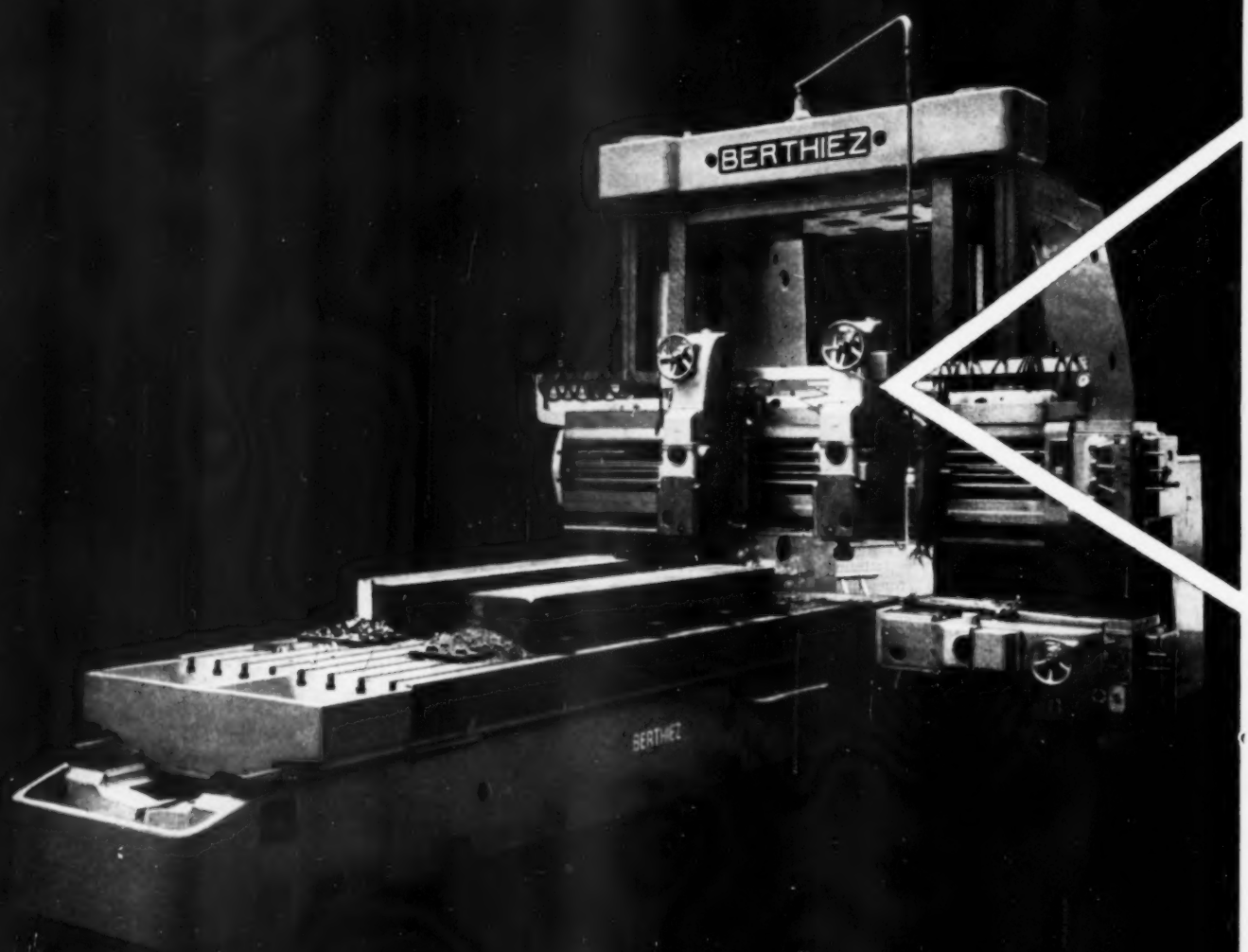
UNION

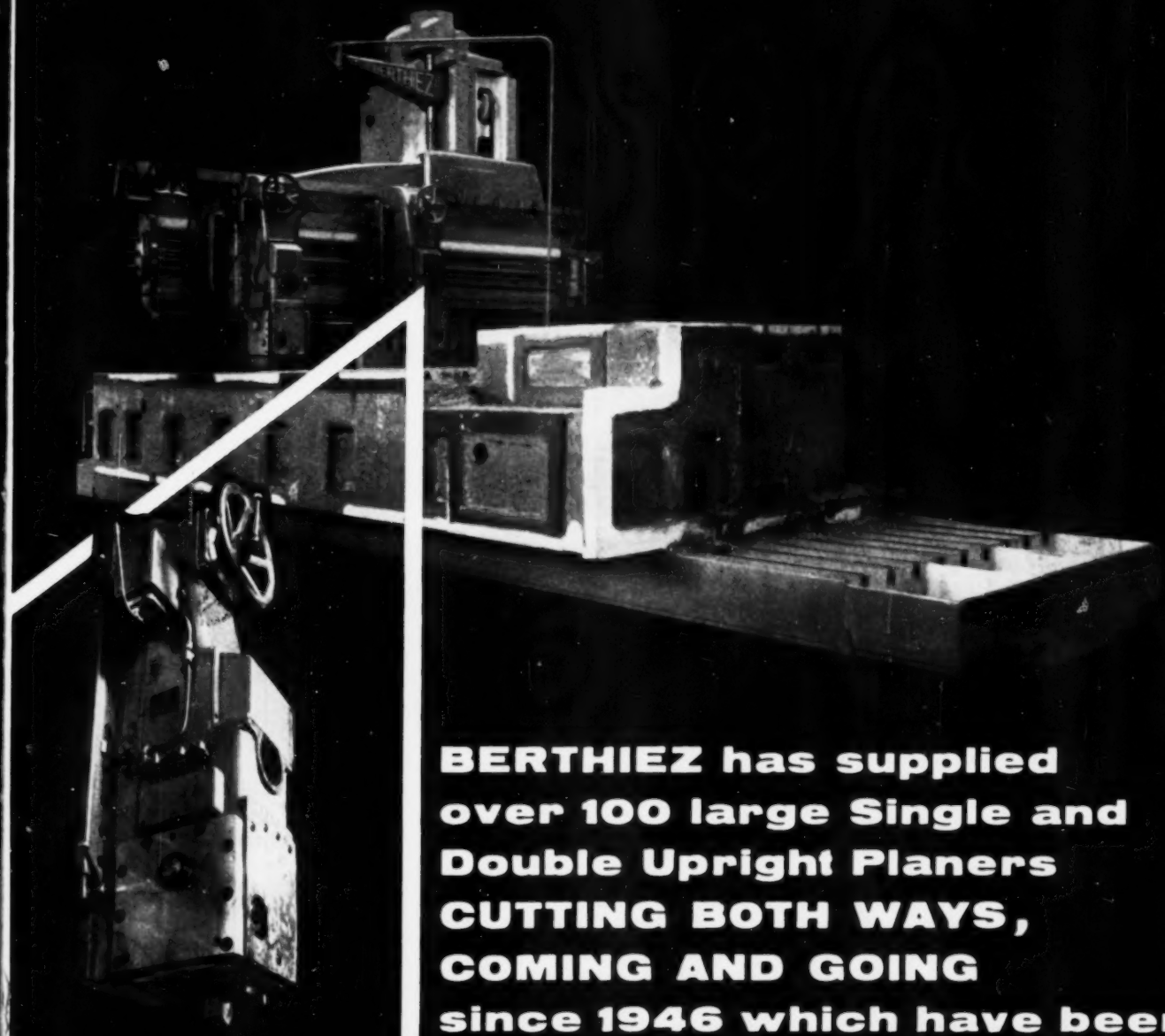
TWIST DRILL COMPANY, Athol, Massachusetts

S. W. CARD DIVISION, Mansfield, Mass.; BUTTERFIELD DIVISION, Derby Line, Vt.

CIRCLE 153 READER SERVICE CARD

BERTHIEZ has been
CUTTING BOTH WAYS,
COMING AND GOING for
the last 12 years
BERTHIEZ has been rough and finish
CUTTING BOTH WAYS with
multiple tools for the last 10 years





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BERTHIEZ

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Fit Square, precision broached openings end sloppy fits and rounded nuts. Strong but thin heads permit plenty of clearance in tight quarters.

Feel Drop-forged alloy steel allows trim heads and slim handles designed to give the same "balanced feel" in all sizes . . . all styles.

Finish Smooth contours and satin finished handles provide a safe and sure grip. Opening sizes legibly stamped. Chrome plated over nickel.

BUY THEM NOW FOR YOUR PLANT . . . ASK FOR CATALOG No. 303

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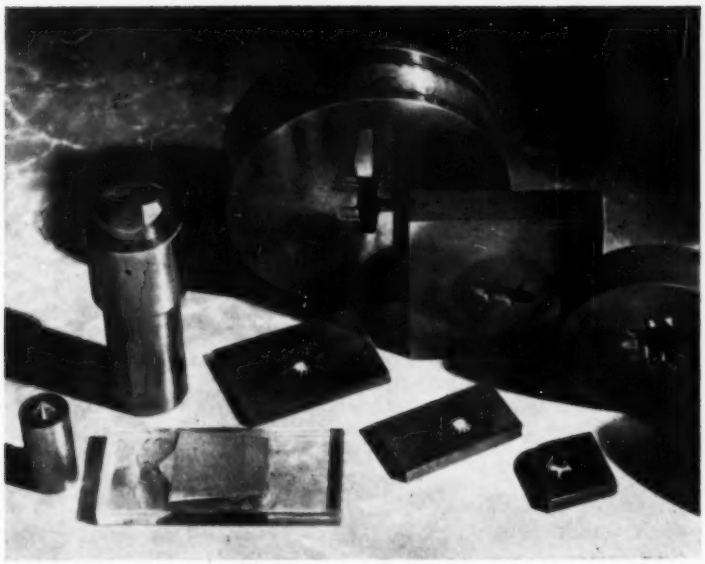
DIVISION OF UNITED-GREENFIELD CORPORATION
400 VULCAN ST., BUFFALO 7, N. Y.



In Ultrasonic Impact Grinding, machines convert electric current into mechanical vibrations at the rate of 25,000 cycles per second, and drive abrasive against the work with an impact force of 150,000 times the abrasive's own weight. The two leading manufacturers of machines for this process recommend NORBIDE abrasive grain as best for nearly all applications. Workpieces shown are of such alloys as Stellite, Rexalloy, and Alnico. In grinding, slicing, dicing, drilling these and many other hard or brittle materials NORBIDE grain is unequalled for high precision and long service life. (Photo courtesy Raytheon Mfg. Co.)

The hardest metal parts are easiest to finish

...when you use NORBIDE* abrasive

Extra hardness, one of the most useful qualities of the new metal alloys, is also one of the most powerful challenges to adequate finishing.

NORBIDE boron carbide grain meets that challenge with its own extra hardness. Of all commercial abrasives, this Norton development is second only to diamonds in hardness. And although diamond dust costs several hundred times as much, NORBIDE grain is comparable in cutting action. That's why it is an outstanding cost-saver in many metal-working jobs.

See your Norton Distributor for details on how NORBIDE abrasive can improve quality and cut costs in your production. Or write to NORTON COMPANY, 39 New Bond Street, Worcester 6, Mass.

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries

In Lapping, NORBIDE grain is the ideal cutting agent in many compounds. To lap carbide inserts, for example, this abrasive in a liquid vehicle gives excellent results without heat, vibration or thermal shock. And unlike conventional abrasives, the resistance of NORBIDE grain to fracturing and splintering keeps finished surfaces free from tiniest scratches on all work, including the new alloy parts shown.

G-357

NORTON
BORON CARBIDE

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes

THOMSON TAKES EXTRA PAINS TO PREVENT FASTENING HEADACHES!
Statistical quality control procedures **plus** 100% inspection give double assurance of close adherence to specified rivet dimensions and positive protection against interrupted production.

YOU GET PRECISION FASTENING AT MASS PRODUCTION COSTS...

. . . when Thomson becomes your fastening partner.

In the Thomson line of more than 8,000 rivet designs, you'll find the semi-tubular, deep-drilled, bifurcated (split), shouldered or compression rivet that will give you the best strength-cost ratio in the fastening field. Produced to the industry's highest quality standards at production rates exceeding 20,000,000 rivets a day, these low-cost fasteners merit serious consideration in your product-improvement and cost-reduction programs.

Our leadership in solving fastening problems with quality rivets and precision rivet-setting machines since 1885 is at your service. What is your problem?

JUDSON L.
THOMSON
MFG. CO., WALTHAM 54, MASS.

BRYANT

EX-CELL-O

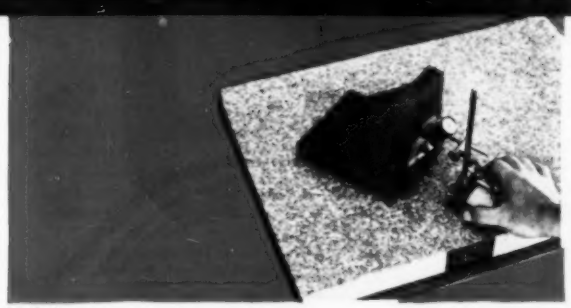
TEAMED UP

TO BETTER SERVE YOUR PRECISION NEEDS

BRYANT B-21 BENCH GAGE

EXACT READINGS 8 TO 10 TIMES FASTER CHECKING INTERNAL AND EXTERNAL THREADS

Now, two famous names team up to fill all your thread, groove and bore gaging needs! The Bryant B-21 Bench Gage, one of many versatile gages now available from Ex-Cell-O, checks all threads, all forms and classes up to 5". The B-21 uses one rigid casting for the base and stationary gaging segment platform, another as a mounting platform for the movable gaging segment. All segments are fully interchangeable. Standard attachments and special accessories permit a wide variety of uses, including checking squareness of face and concentricity of diameters, and checking parts with standard snap-ring or "O"-ring grooves or special grooves.



59-B-1

BRYANT GRANITE SURFACE PLATES

ROCK OF AGES

UTMOST PRECISION OF SURFACE—UNEXCELLED WEAR RESISTANCE

Only *true* granite, with the Bryant-patented "head of the grain" finishing, can provide surface-wide hardness and homogeneity. Available in standard and special sizes. Welded steel stands of modern design available for all plates.

FREE FACT-FOLDERS—Engineering data, accessory and attachment details, shipping information and prices on the full line of Bryant Internal and External Thread and Groove Gages. Also sent free of cost or obligation: the full story of how Bryant Granite Surface Plates can make a big difference in your lay-out, inspection and assembly work. Read the results of unbiased wear-tests of nearly 30 different surface plates—get *all* the facts before you buy! Same-day reply to every inquiry.

EX-CELL-O CORPORATION

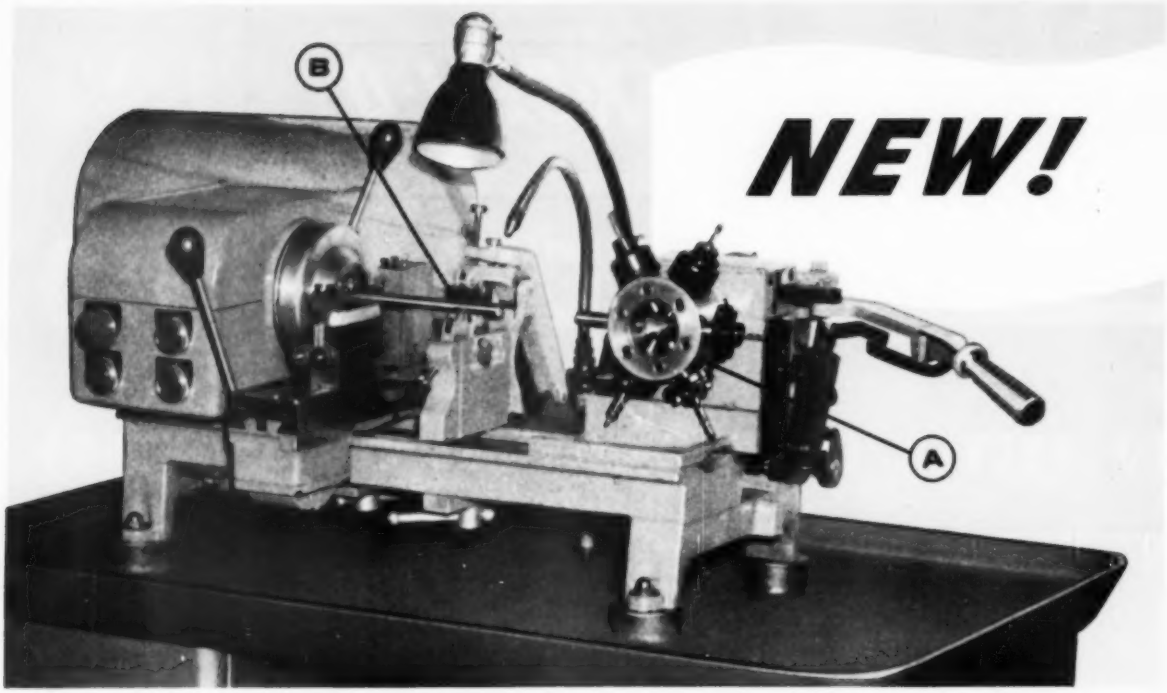
EX-CELL-O FOR PRECISION

XLO

GREENVILLE PLANT, 945 E. SATER ST., GREENVILLE, OHIO

EX-CELL-O PRECISION PRODUCTS INCLUDE: MACHINE TOOLS • GRINDING AND BORING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • TORQUE ACTUATORS • THREAD AND GROOVE GAGES • GRANITE SURFACE PLATES • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

CIRCLE 159 READER SERVICE CARD



NEW!

CHALLENGE .625" PRECISION TURRET LATHE

for faster handling of secondary operations or short runs on small precision parts

Look at these important new operating features:

(A) AUTO-INDEX TURRET

Vertical turret automatically returns to starting position when operating lever is lowered, eliminating need for operator to index through all positions to return to starting position. Number of work stations desired can be preset.

(B) AUTOMATIC STEADY REST

Steady Rest automatically opens when turret indexes back to starting position, speeds removal of work pieces.

You'll want to know all about these and many other cost cutting features of the Challenge 625 . . . push button control, easy collet operation, two-post cross slide.

Rigid steel stand is integral part of machine, houses coolant tank and pump. Entire machine is 42" long, 25" wide, 51" high, occupies minimum floor space.

TL-101

Available through selected machine tool dealers. For complete information, write today.

Challenge

THE CHALLENGE MACHINERY COMPANY
101 North First Street
GRAND HAVEN, MICHIGAN

Precision Tool News

NO. 9 B·S REPORTING NEW DEVELOPMENTS AT BROWN & SHARPE'S PRECISION CENTER

Booklet summarizes features of new B&S tools introduced during 1958

Brown & Sharpe's 20-page booklet entitled "New Precision Tools" is of interest to anyone concerned with tooling or metalworking production. It describes and illustrates all of the latest tools introduced by this company. Improvements in accuracy; savings in time and money; and easy-handling characteristics are spelled out so that the reader can tell what each new tool has to offer him in his own operations. The booklet is available for the asking from your distributor or from Brown & Sharpe Mfg. Co., Providence, R. I.

A few of the latest tools described in Brown & Sharpe's new booklet:

- Convertible Thimble Micrometer provides "friction" or fixed thimble at will.
- Greatly expanded line of "Black Frame" Micrometers offers higher quality at lower prices.
- Hite-Icators and Riser Blocks measure any desired height, quickly, easily, accurately.
- Self-contained, transistorized 36" electronic Super Hite-Chek reads in .000025".
- 8" Vernier Height Gage takes small measurements accurately . . . costs less.
- Complete line of simple and compound sine tools, permanent magnet and inspection types, bring accuracy and speed to angular measurements.
- New, lower, permanent magnet chucks hold better . . . provide greater work clearance.
- Dial Bore Gages and Setting Devices — cover greatest range at lowest cost.
- "Ready Mark" Ground Flat Stock comes pre-colored with non-cracking finish, ready for scribing. Oil-and air-hardening types.

B&S traveling exhibit shows newest tools right at plants . . . welcomes invitations

The B&S "Mobile Precision Center" shows Brown & Sharpe tools to interested personnel at plants throughout the country. It operates on the theory that no one can fully appreciate the excellence of design and ease of usage of a new tool until he's held and used it in his own hands. Tool users agree; in 1958 the B&S truck visited 1000 plants in 48 states, with over 25,000 people attending.

The Mobile Precision Center welcomes an invitation to visit your plant during 1959. Requests should be made as early as possible in the year, through your Brown & Sharpe distributor. All tools exhibited are available to you from his stock — quickly, and economically. Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

Brown & Sharpe
INDUSTRIAL PRODUCTS DIVISION
PRECISION TOOLS AND GAGES
SCREW MACHINE TOOLS
SHOP ACCESSORIES

B·S

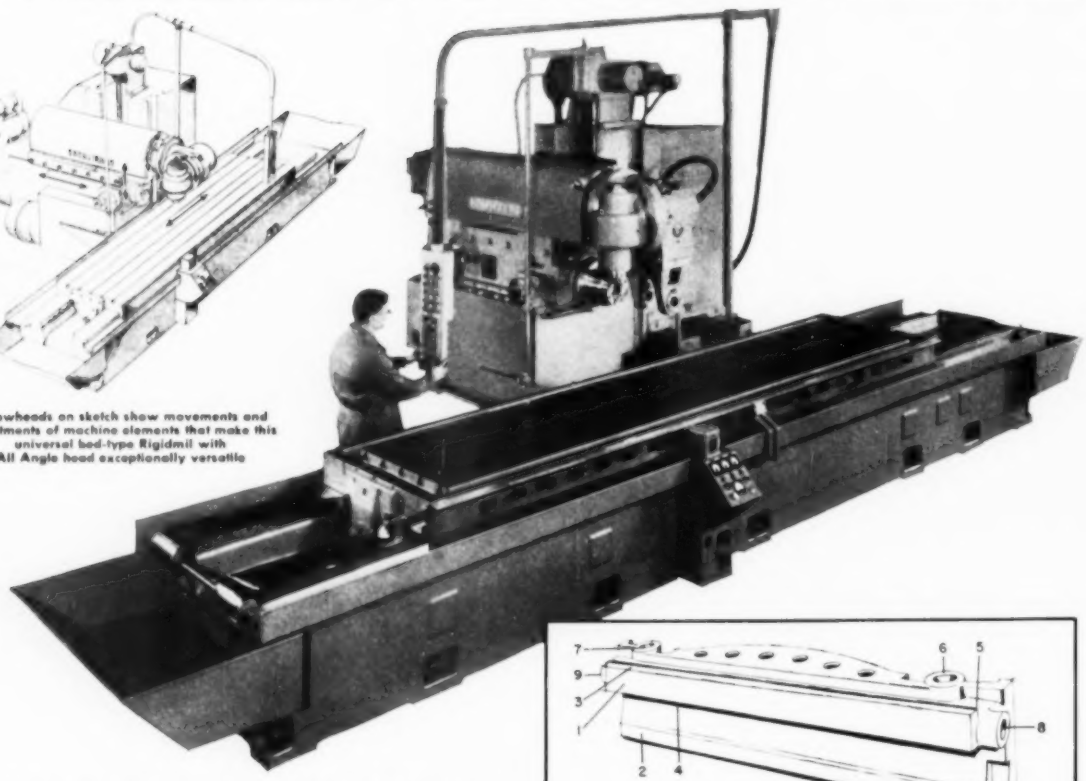
PROGRESS IN PRECISION FOR OVER 125 YEARS

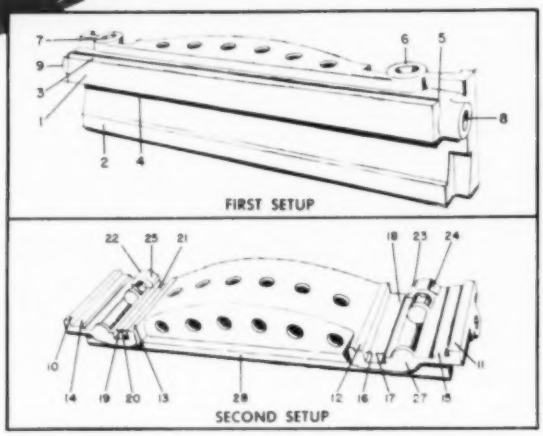
INDUSTRIAL DISTRIBUTORS THE RIGHT HAND OF PRODUCTION

PRECISION TOOLS AND GAGES • MILLING, GRINDING AND SCREW MACHINES • CUTTERS • MACHINE TOOL ACCESSORIES • PUMPS AND HYDRAULIC VALVES

SUNDSTRAND 50-hp machines 28

Arrowheads on sketch show movements and adjustments of machine elements that make this universal bed-type Rigidmil with All Angle head exceptionally versatile





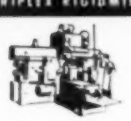
● Do you need a machine that has rigidity and power for a wide range of cuts and adds versatility to reduce parts handling and the need for expensive, special fixturing? If you do, then the universal bed-type Rigidmil with All Angle head was practically designed for you. The 28 surfaces machined in the two setups shown are typical of the range of operations readily handled on this machine.

Both the horizontal spindle head and the All Angle ram type head have the horsepower needed to handle sizable cuts. Horizontal spindle provides 50-hp maximum, and the All Angle head 20-hp maximum.

Up to 216 inches table feed stroke . . . ⅜ to 220 inches per minute longitudinal table feed . . . ⅜ to 100 ipm transverse column feed . . . ⅜ to 50 ipm head feed . . . pushbutton control of machine speeds and movements . . . these are some of the features that indicate the machine's ability to handle a broad range of work. Slab milling can also be performed using the main spindle and mounting an arbor support on the dovetail ways provided in the machine's design.

AUTOMATIC LATHES | SIMPLEX RIGIDMILLS | DUPLEX RIGIDMILLS | TRIPLEX RIGIDMILLS | SPECIAL MACHINES

SUNDSTRAND "Engineered Production" Service"



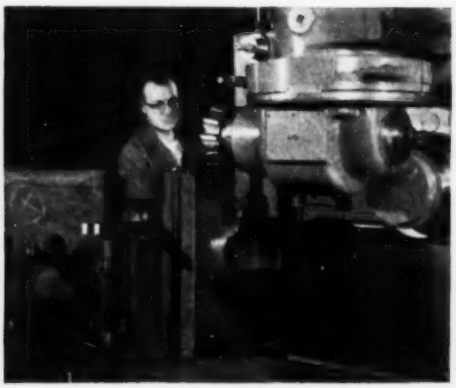
RIGIDMIL
surfaces in just 2 setups

Positioning cutter instead of work reduces setup time

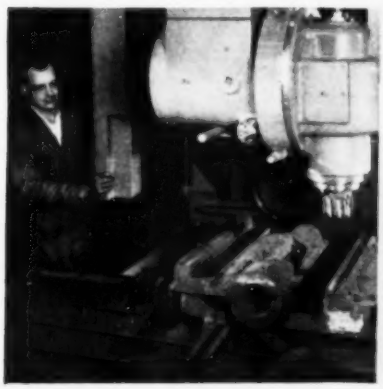
HERE'S HOW TO CUT SETUP TIME . . . Sizable cuts are taken with both the All Angle head and the main horizontal spindle so that production rate stays high despite the unparalleled flexibility. Carbide cutters are used to full advantage on both spindles as shown in typical operations below. Accuracy invariably exceeds that possible on conventional machines because of reduced parts handling. Surfaces 1 to 9 machined in first setup. Surfaces 10 to 28 machined in second setup.

HORIZONTAL SPINDLE and longitudinal table feed are used for face milling first surfaces of large casting.

MACHINING ON TOP of the work is illustrated in this example using the All Angle head and longitudinal table feed.



ANOTHER EXAMPLE of the ease with which it is possible to move the cutter instead of workpiece is on this step using All Angle head and vertical feed.



ANOTHER POSSIBLE combination of machine movements is shown here where All Angle head in vertical position is coupled with transverse feed.

ALL ANGLE HEAD is used to mill clearance cuts at an angle using transverse feed. All power feeds are infinitely variable.

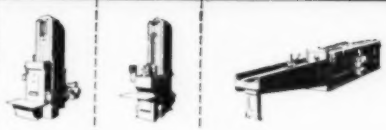
HORIZONTAL SPINDLE returns to action in combination with longitudinal table feed. Power operated drawrod (extra) for horizontal spindle makes cutter changing easier.

ADDITIONAL DATA describing the universal bed-type Rigidmil with All Angle head is available in Bulletin 199. Write for your copy today!

SUNDSTRAND MACHINE TOOL CO.

2533 ELEVENTH ST., ROCKFORD, ILLINOIS

BROACHING TOOLS | THREE WAY | SINGLE RAM | HORIZONTAL | DUPLEX RAM | PRESSES



SUNDSTRAND "Engineered Production" Service"

Drilling Time Reduced 50%

BURGMASTER *tape controlled*

with automatic numerical

The Burgmaster G. E. Tape Controlled Turret Drill is installed in an air-conditioned dark room for exposing the film for making etched copper circuit boards. The tape reader and control cabinet are mounted outside the dark room.

Programming and Tape Preparation Manufacturing personnel transpose drawing decimal dimensions to a program sheet including feeds, speeds, spindle sequence, and any auxiliary functions. A typist then prepares the standard eight-hole punched tapes in a matter of minutes and checks it for accuracy from a typed tape produced at the same time. Duplicate tapes can be produced in seconds automatically, and new instructions (representing design changes) can be spliced in at any point.

General Electric Company, Phoenix, Arizona, Computer Department, not only cut drilling time 50% in manufacturing printed circuit boards, but actually eliminated 124 expensive fixtures that would have cost six times the machine investment. Approximately 2400 holes of three sizes are drilled in 124 different panels at the rate of 15 to 20 holes per minute, holding ±.002" tolerances between holes.

Burgmaster Plays a Double Roll

Not only is the Burgmaster Tape Controlled Turret Drill used for drilling the panels, but it is also used for exposing the film from which the etched circuit board is made. Computer engineering techniques were used to determine wire tables—the least distance of wiring runs—for programming a punched tape for exposing the negative automatically on the Burgmaster, using a light source as a tool on the turret, and finally, for programming the punched tape for drilling the holes automatically. This unique manufacturing and engineering method greatly reduced the engineering time, and lead time to get into production, in addition to cutting machining time 50%. No complete engineering drawings were required for making expensive tooling and it was estimated that three engineers did the

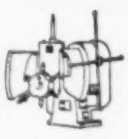
JOB FACTS:

Machine	Burgmaster G. E. Tape Controlled 6 Spindle Drill.
Parts	124 Different Etched Copper Circuit Boards
Material	Copper Clad Epoxy Glass 15" x 26" x .093" Thick
Operations	Drill .029, .052, and .193 Holes
Rate of Drilling	15 to 20 Holes per Minute—3 Shifts
No. of Holes	Approximately 2400 per Panel
Accuracy Required	±.002" between Holes
Fixture	Simple Clamps, Corner Location

Specialists in High Production Turret Drilling

1C Manual Power Index 3/8" Capacity

2B Manual Power Index 3/4" Capacity

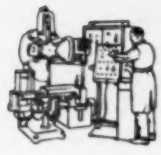


2BF Flange Mounted Power Index 3/4" Capacity

2BH Automatic Hydraulic 3/4" Capacity

3BH Automatic Hydraulic 1½" Capacity

2BR Ram Type Radial Drill 3/4" Capacity



2BHT—3BHT Automatic Tape Controlled 3/4" and 1½" Capacity

124 $1500 Fixtures Eliminated

6 Spindle Turret Drill

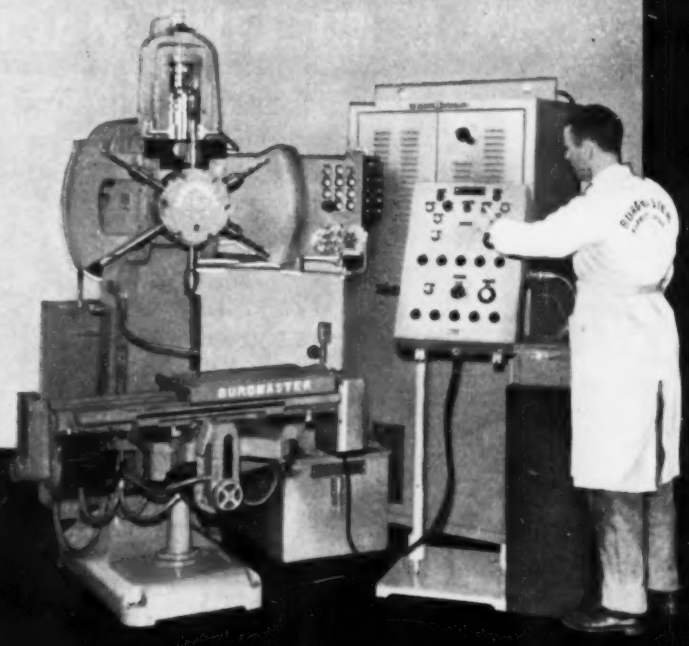
table positioning control

work of thirty engineers and produced far more accurate results—faster.

Maximum Flexible Automation

The application of G.E. Numerical Controls to either Standard Burgmaster 6-spindle or 8 spindle turret drilling, tapping and boring machines results in maximum flexible automation. That is, *these field proven Burgmaster machines* can be quickly and economically set up to produce a large variety of parts using standard tools and simple holding clamps. The standard adjustable Burgmaster controls are maintained...including pre-selective spindle speeds, infinitely variable pre-selective feeds, selective rapid approach and return, skip indexing, precision depth control, and simple manual controls for set-up. The G.E. numerical system controls all machine functions, selects spindles in any sequence, automatically positions the table on two axes, clamps the table while machining operations are performed, and controls coolant. Up to six different operations can be performed at any command position without moving the table, or as many cycles using one tool as desired, without indexing. All operations are carried out at their most efficient rate for high finish, precision, speed, and longest tool life. As a result one man can operate two or more machines on many jobs, or by attaching two tapes together one part can be machined on one end of the table while work is being set up on the other to effect constant machine operation.

The savings that can be realized from Automatic Tape Controlled production on small lots or high production is tremendous. Why not get all the facts on your work? There is a Burg direct representative or dealer near you. Call him —there is no obligation.



This is a general view of the entire automatic manufacturing unit comprising the Burgmaster 6 Spindle turred drill, G.E. tape control unit, control cabinet and tape reader. Price, $29,000 complete. G.E. Tape Control can also be applied to the Burgmaster 8 Spindle Turret Drills. Capacities are ¾" and 1½" in steel, tables 10" x 18" and 18" x 30". Larger automatic positioning tables also available.

Alternate Method Using Expensive Drill Jigs (Estimated cost $1500 ea.) and Semi-Automatic Multi-Spindle Drills.

Savings 50% Reduction in Drilling Time—124 $1500 Fixtures Eliminated, 3 Engineers Instead of 30 Using Computer Techniques—greatly reduced lead time.

Write for Bulletin describing Burgmaster 6 and 8 Spindle Tape Controlled Turret Drilling, Tapping, and Boring Machines. Thirty-minute 16mm sound film showing all Burgmaster Turret Drills in operation is available from any office without charge.

BURG TOOL

MANUFACTURING COMPANY, INC.

15001 South Figueroa Street, Gardena, California

FAculty 1-3510 DAvis 9-4158

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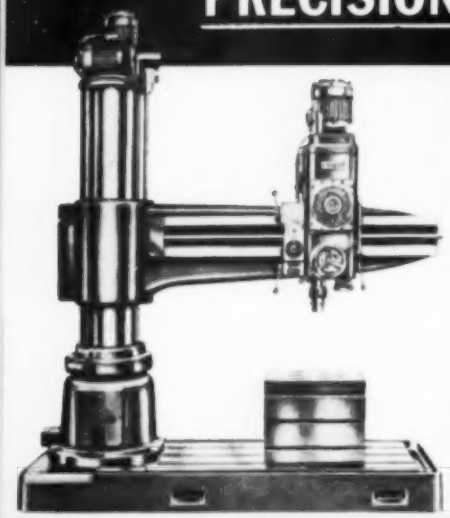
Plus dealer representatives in other industrial centers.

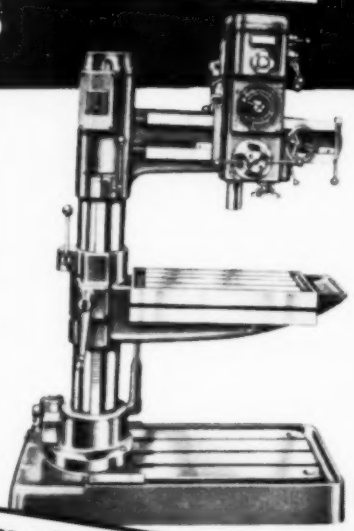
IMPERIAL PRECISION RADIAL DRILLS

UNBELIEVABLE VALUES!



Model	Col. Diam. Inches	Arm	Base Price
L-26	7½	26	$1995.
L-2½	8¼	2½	$2085.
L-3	8¼	3	$2195.
M-3PE	10	3	$3995.
M-4PE	12⅜	4	$4985.
M-5PE	14	5	$6295.
M-6PE	14	6	$6985.

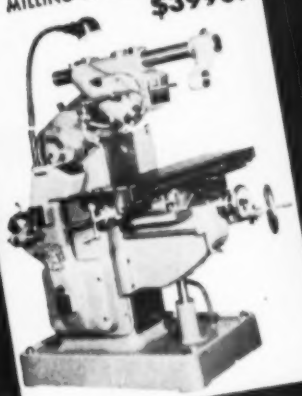
IMMEDIATE DELIVERY



Available from stock!

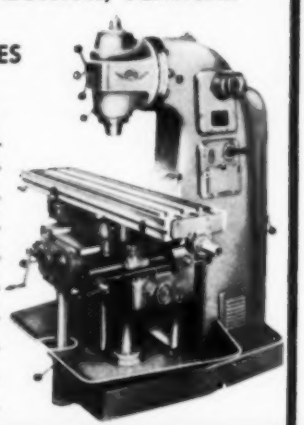
PRECISION MILLING MACHINES

ABENE
VERTICAL HORIZONTAL MILLING MACHINE
$3990.

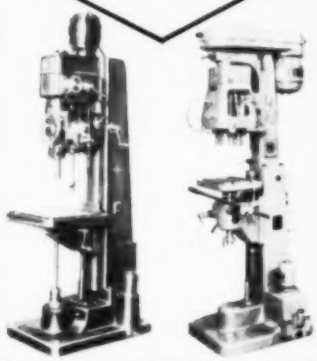


PEDERSEN HORIZONTAL, VERTICAL and combination MILLING MACHINES

Model	Table Size in Inches	Base Price
VPF-00	35½x8¼	$1663.
VPV-00	35½x8¼	$2463.
VPU-0	39½x9½	$2890.
VPU-1	51x12	$3260.
VPV-1	51x12	$3760.
VPF-2	61x12	$6185.
VPU-2	61x12	$6285.
VPV-2	61x12	$6885.
VPF-4	75x16	$12850.



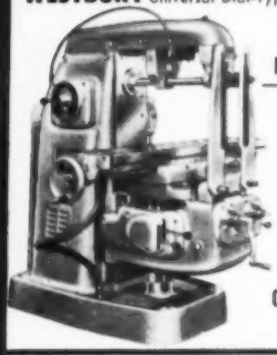
IMPERIAL DRILLING MACHINES



Model	Capacity cast iron	Base Price
25/1	1¼"	$1195.
35/1	2"	$1695.
45/1	2"	$2295.
MU-8	8 spindles	$795.
MU-12	12 spindles	$495.

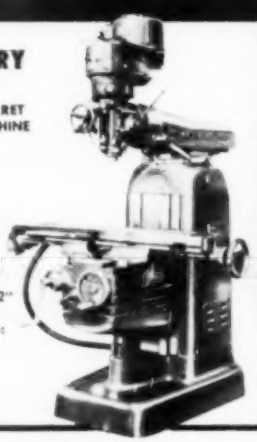
THOUSANDS SOLD TO SATISFIED CUSTOMERS!

WESTBURY Universal Dial-Type Horizontal Milling Machines



Model	Table Size in inches	Base Price
1U	40x10	$3390.
2U	51¾x10¾	$5265.
3U	60x12¼	$6275.
1-S	42x9	$1690.
Contour	42x9	$3190.

WESTBURY I-S
VERTICAL TURRET MILLING MACHINE
$1595
Incl. Motor & Controls



1½ H.P. 9"x32" Table
Available With:
9"x42" Table $95. extra
Coolant $155. extra

LIBERAL TERMS
RENTAL PLANS

AARON MACHINERY CO., Inc.

Dept. A 45 CROSBY ST. NEW YORK 12, N.Y. • WA 5-8300

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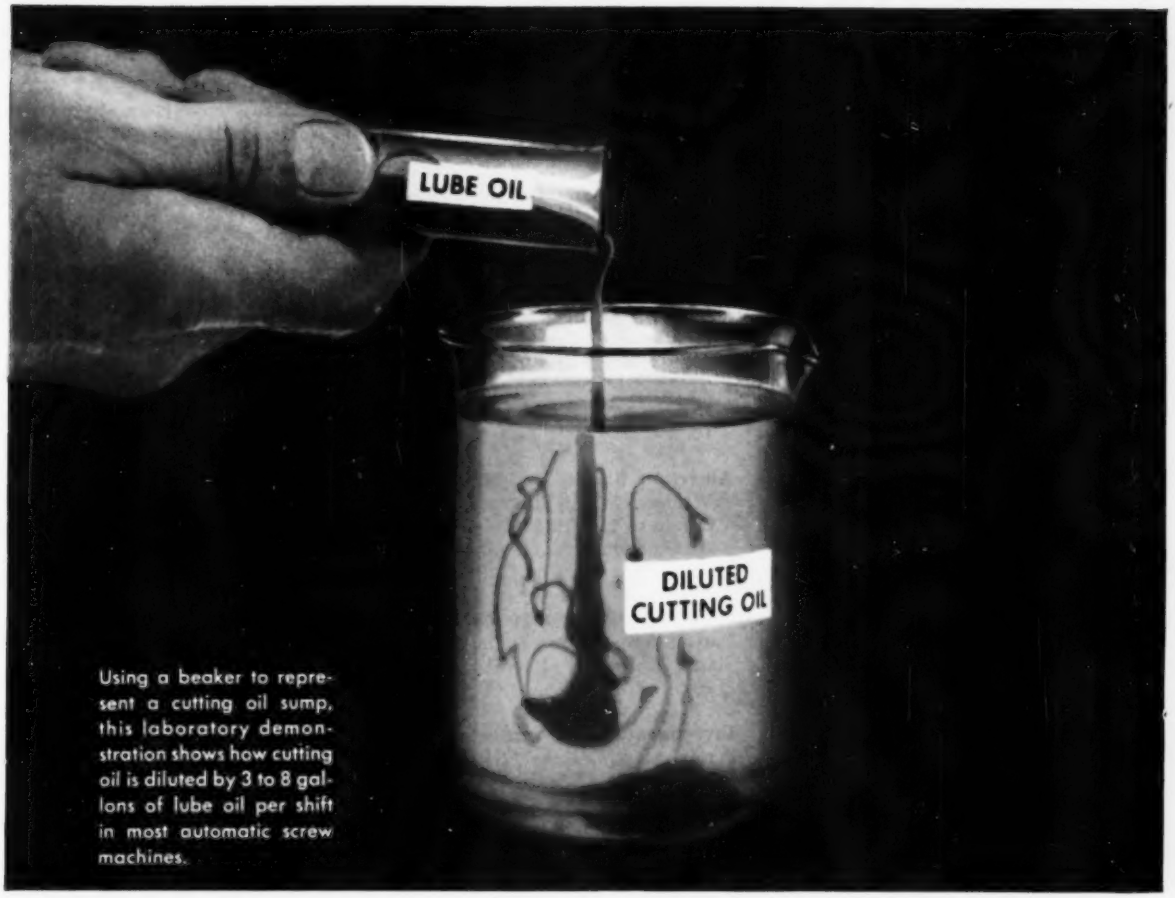

Using a beaker to represent a cutting oil sump, this laboratory demonstration shows how cutting oil is diluted by 3 to 8 gallons of lube oil per shift in most automatic screw machines.

It happens in 7 out of 10 automatics!

Diluted cutting oil can cut output 33%

No matter how careful your lubricating techniques, you still can't stop lube oil from leaking into the cutting oil sump on 70% of automatic screw machines. As cutting oil is diluted, it loses strength—ingredients that make it efficient become less and less effective. The natural consequence is shortened tool life, more downtime and a higher percentage of rejects.

Texaco Cleartex can end this problem forever. All you have to do is use Cleartex for both cutting *and* lubrication . . . and watch your production rise. The exceptional chemical stability and load-carrying ability of the Cleartex series make them equally suitable for use as cutting oils, lubricants and hydraulic fluids. (70% of all automatic screw machines can benefit from the "Cleartex Cure!")

TAKE THE CLEARTEX CURE SOON!

Write today for your copy of Texaco's new booklet—"Cleartex in Automatic Screw Machines." This new illustrated guide will fill you in on the details, show you where you may be losing profits and how to avoid it . . . Or contact your local Texaco Lubrication Engineer soon for an authoritative survey of your automatics. Just call the nearest of more than 2,000 Texaco Distributing Plants, or write to The Texas Company, 135 East 42nd Street, New York 17, New York. Dept. AM-10.

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for greatest accuracy and smoothest finish

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1959 Calendar

Society of the Plastics Industry—Annual Exhibit and Conference, Reinforced Plastics Div, Feb 3-5, Edgewater Beach Hotel, Chicago, Ill.

American Society of Mechanical Engineers — Aviation Conference. Mar 8-12, Statler-Hilton Hotel, Los Angeles, Calif.

Pressed Metal Institute—Spring Technical Meeting, Mar 11-13, Pick-Congress Hotel, Chicago, Ill.

American Society for Metals — Western Metal Exposition and Congress, Mar 16-20, Pan-Pacific Auditorium and Ambassador Hotel, Los Angeles, Calif.

American Machine Tool Distributors Association—Spring Meeting, Mar 17-19, Sheraton Park Hotel, Washington, DC.

Investment Casting Institute—Annual Meeting, Mar 17-19, Santa Monica, Calif.

Society of Automotive Engineers —National Production Meeting, Mar 19-20, Sheraton-Cadillac Hotel, Detroit, Mich.

Society of Automotive Engineers —National Aeronautic Meeting, Production Forum, and Display, Mar 31-Apr 3, Hotel Commodore, New York, NY.

American Welding Society—Annual Meeting and Exposition, Apr 6-10, Sherman Hotel and Donovan Hall, Chicago, Ill.

"Willoughby is being transferred to the shipping department, I see."

American Foundrymens Society—Engineered Castings Show, Apr 13-17, Sherman and Morrison Hotels, Chicago, Ill.

American Society of Tool Engineers—Annual Meeting, Apr 18-22, Schroeder Hotel, Milwaukee, Wis.

Metal Powder Industries Federation—Annual Meeting and Powder Metallurgy Show, Apr 20-22, Sheraton-Cadillac Hotel, Detroit, Mich.

Metal Treating Institute—Spring Meeting, Apr 23-25, Hollywood Beach Hotel, Hollywood, Calif.

National Screw Machine Products Association — Annual Meeting, Apr 26-29, Roosevelt Hotel, New York, NY.

Grinding Wheel Institute & Abrasive Grain Association — Semi-Annual Meeting, Apr 27-29, The Homestead, Hot Springs, Va.

American Society of Mechanical Engineers—Metals Engineering Conference, Apr 29-May 3, Sheraton-Ten Eyck Hotel, Albany, NY.

American Institute of Electrical Engineers — Automatic Techniques Conference, May 11-13, Pick-Congress Hotel, Chicago, Ill.

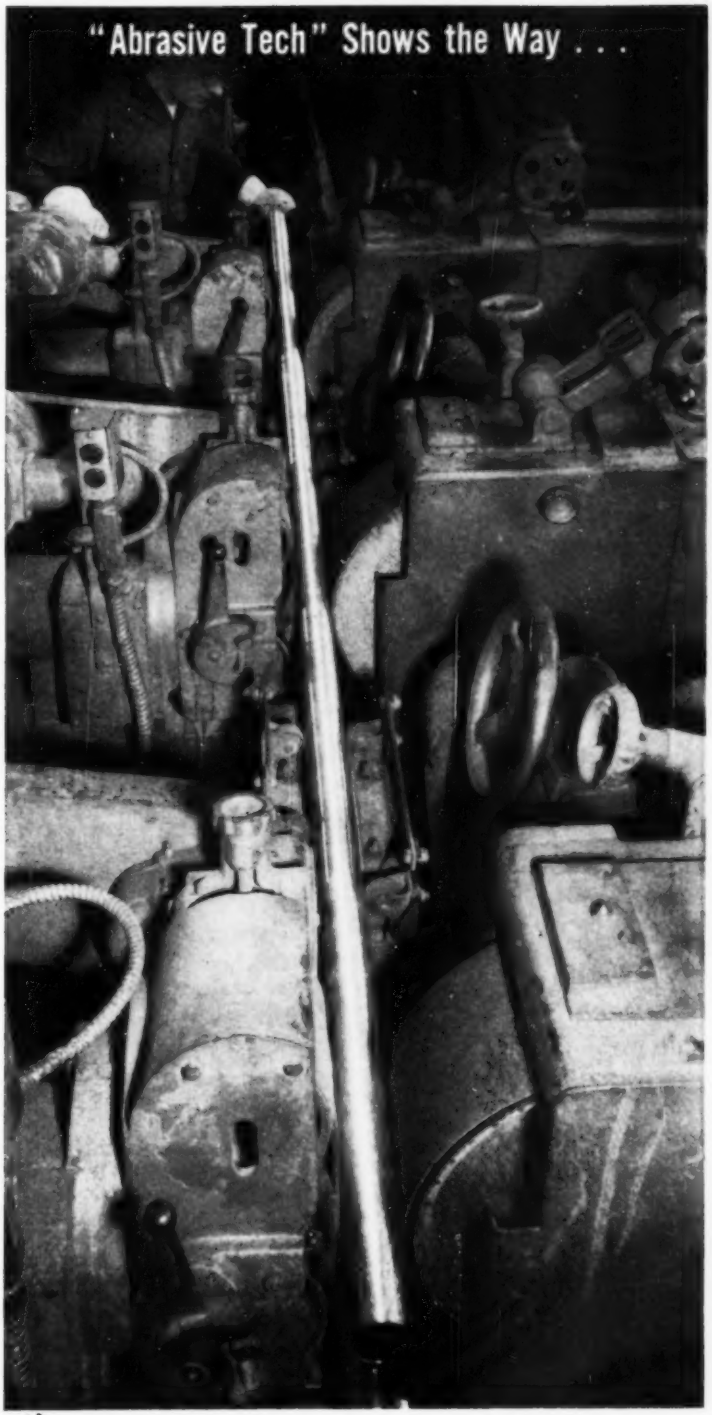
American Society of Mechanical Engineers — Production Engineering Conference, May 12-14, Statler-Hilton Hotel, Detroit, Mich.

Machinery Dealers National Association — Annual Meeting, May 13-15, Plaza Hotel, New York, NY.

American Supply & Machinery Manufacturers Association — Triple Industrial Supply Convention, May 13-15, Dallas, Texas.

Amercian Institute of Industrial Engineers—National Conference and Convention, May 14-16, Hotel Biltmore, Atlanta, Ga.

Magnesium Association — Annual Meeting, May 18-19, The Cloisters, Sea Island, Ga.



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IA-1

New!

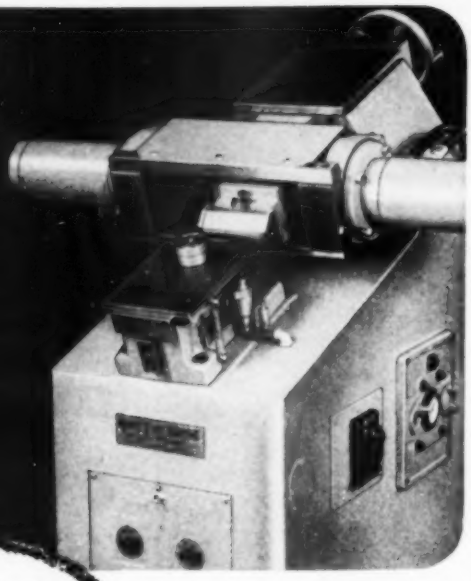
SERIES

46

UNIVERSAL

ROLL-MARKING

MACHINES



for

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- ✓ **Marking flat surfaces**
- ✓ **Precision graduating**
- ✓ **Serial numbering**
- ✓ **Knurling**

Model 46-354 marks bearing races 1" to 6" in diameter. Cyclomatic Control and air ejection require operator merely to load piece parts.

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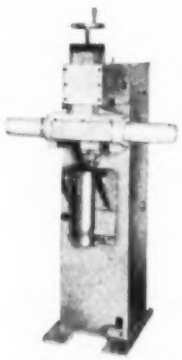

Model 46-382 (Vertical) marks flat surfaces from shell cases to kitchen utensils with equal facility.

Model 46-384 marks large diameter jet engine rings and similar parts.

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GRADUATING

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American Society for Quality Control — Annual Convention and Exposition, May 25-27, Public Auditorium and Hotel Cleveland, Cleveland, Ohio.

American Gear Manufacturers Association — Annual Meeting, May 31-June 3, The Homestead Hot Springs, Va.

Material Handling Institute—National Exposition, June 9-12, Public Auditorium, Cleveland, Ohio.

National Association of Metal Finishers—Annual Meeting and Convention, June 14-16, Statler-Hilton Hotel, Detroit, Mich.

American Society of Mechanical Engineers—Semi-Annual Meeting, June 14-18, Chase-Park Plaza Hotel, St Louis, Mo.

Society of Automotive Engineers —Summer Meeting, June 14-19, Chalfonte-Haddon Hall, Atlantic City, NJ.

Drop Forging Association — Annual Meeting of Members, June 21-24, Essex and Sussex Hotels, Spring Lake, NJ.

American Society for Testing Materials—Annual Meeting, June 21-26, Chalfonte-Haddon Hall, Atlantic City, NJ.

Pressed Metal Institute—National Meeting, Sept 13-17, Stanley Hotel, Estes Park, Colo.

Society of Automotive Engineers —Farm, Construction, and Industrial Machinery Meeting and Display, Sept 14-17, Milwaukee Auditorium, Milwaukee, Wis.

American Die Casting Institute—Annual Meeting, Sept 16-17, Edgewater Beach Hotel, Chicago, Ill.

Instrument Society of America — Instrument-Automation Conference & Exhibit, Sept 21-25, Int'l Amphitheatre, Chicago, Ill.

American Welding Society—National Fall Meeting, Sept 28-Oct 1, Sheraton-Cadillac Hotel, Detroit, Mich.

Society of Automotive Engineers —National Aeronautic Meeting

and Display, Oct 5-10, Ambassador Hotel, Los Angeles, Calif.

American Society for Testing Materials—Pacific Area National Meeting, Oct 11-16, Sheraton Palace Hotel, San Francisco, Calif.

Magnesium Association—Annual Convention, Oct 19-20, Hotel Roosevelt, New York, NY.

American Institute of Electrical Engineers—Machine Tool Conference, Oct 19-21, Hotel Cleveland, Cleveland, Ohio.

American Machine Tool Distributors Association — Annual Meeting, Oct 25-27, Statler Hotel, St Louis, Mo.

American Gear Manufacturers Association — Semi-Annual Meeting, Oct 25-28, Edgewater Beach Hotel, Chicago, Ill.

National Metal Trades Association—Annual Meeting, Oct 29-31, Sheraton-Biltmore Hotel, Providence, RI.

American Society for Metals—National Metal Exposition and Congress, Nov 2-6, International Amphitheatre, Chicago, Ill.

National Tool & Die Manufacturers Association — Annual Convention, Nov 4-8, Statler-Hilton Hotel, New York, NY.

Metal Treating Institute—Annual Fall Meeting, Nov 6-7, Sheraton Hotel, Chicago, Ill.

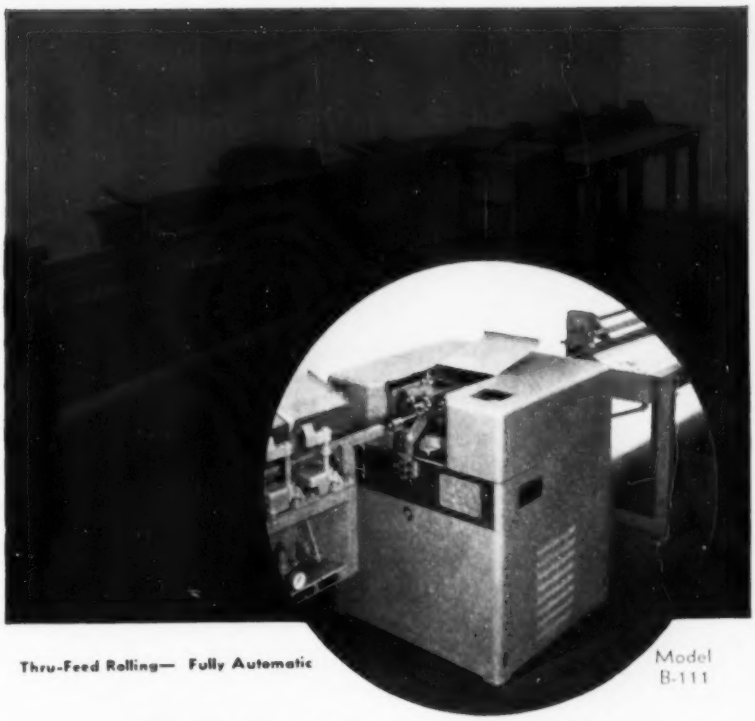
National Screw Machine Products Association — Fall Membership Meeting, Nov 14-18, Americana Hotel, Bal Harbor, Fla.

International Automation Congress & Exposition, Nov 16-20, New York Trade Show Building, New York, NY.

Packaging Machinery Manufacturers Institute—National Exposition, Nov 17-20, Coliseum, New York, NY.

American Society of Mechanical Engineers — Annual Meeting, Nov 29-Dec 4, Chalfonte-Haddon Hall, Atlantic City, NJ.

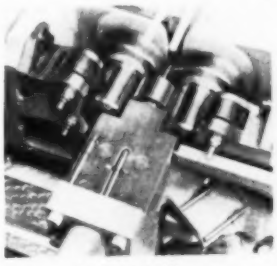
Drop Forging Association—Winter Meeting of Members, Dec. 6-9, Savoy-Hilton Hotel, New York, NY.



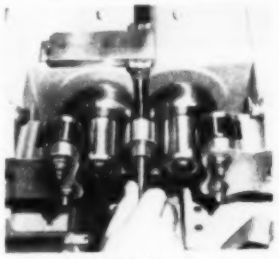
Thru-Feed Rolling— Fully Automatic

Model B-111

.... for Production or Job lot Threading and Form Rolling



In-Feed Rolling— Fully or Semi-Automatic



In-Feed Rolling— Manual loading

REED Two-Die Type Cylindrical Die Thread Rolling Machines

The flexibility of the Reed B-111 machine provides for the most economical selection of equipment to suit job lot or quantity production requirements.

Standard machines are available for in-feed or thru-feed rolling or a combination of both for a wide range of thread and form rolling applications. Precise micrometer die and work positioning adjustments assure continuous production of uniform accurate threads and forms.

Write for Machine Bulletin B-111-1

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THIS NEW HELLER ORIGINAL DESIGN meets industry's demand for a multi-purpose file that roughs to size and smooths to finish faster . . . with less pressure on tough, dense metals . . . with less loading on softer metals.

DOUBLE DIAGONAL CHIP-BREAKER GROOVES are the exclusive key to the new CRISS-CROSS Multi-Kut files superior performance.

HERE'S HOW THEY WORK! Each section of the CRISS-CROSS pattern has "flying wedge" action for faster penetration. Then, widening teeth hog off metal in time-saving bites. Finally, narrowing teeth finish the work to specified smoothness. In the meanwhile, the combination of vari-sized teeth and criss-cross grooves breaks up chips and keeps them on the move.

SEE THE CRISS-CROSS MULTI-KUT IN ACTION! Your nearby Heller distributor will be glad to demonstrate this Heller "Job-Proved" file on the metals of your choice. Available in Flat, Half Round and Square shapes in 8", 10", 12" and 14" sizes. Why not make a date today?

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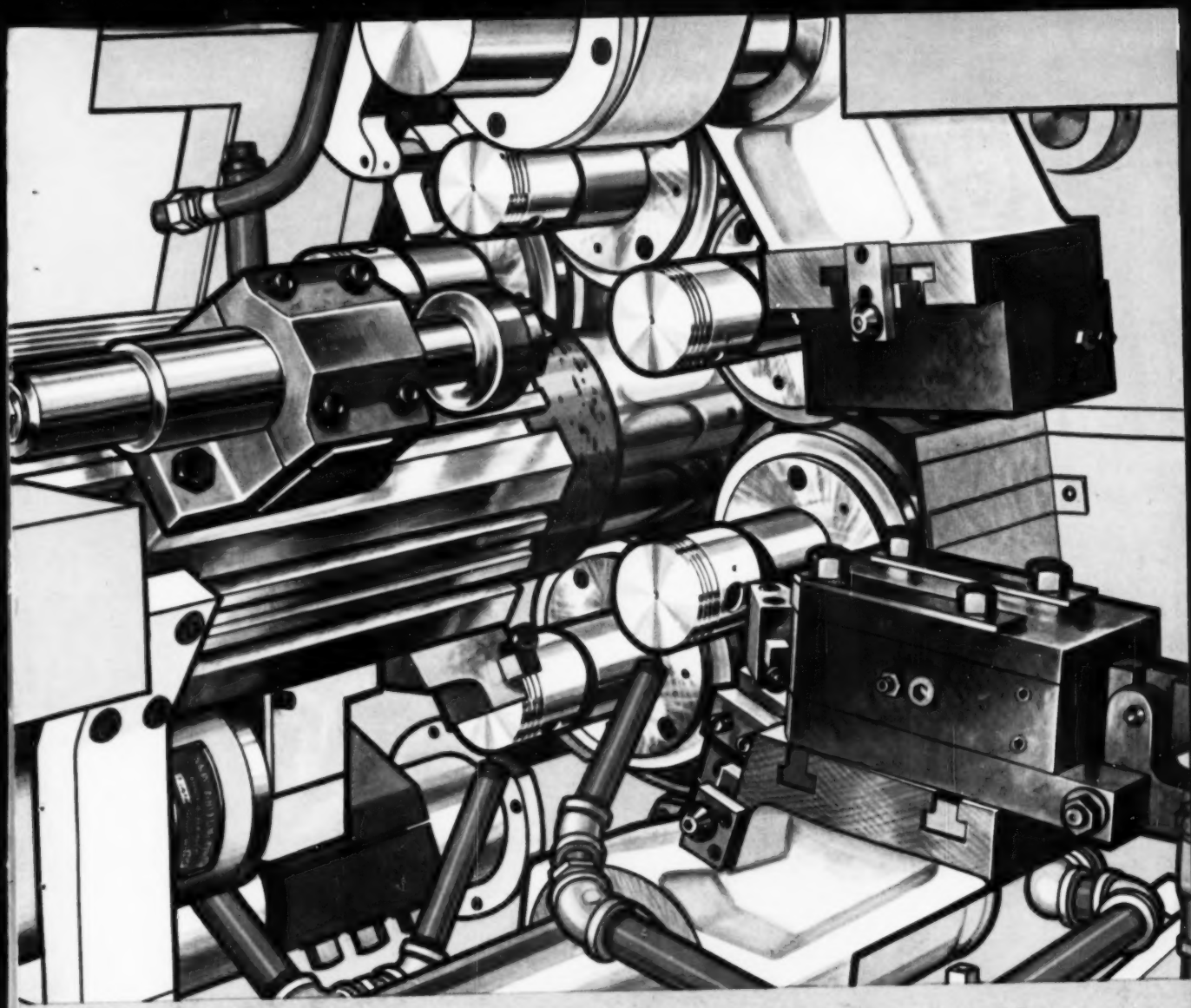
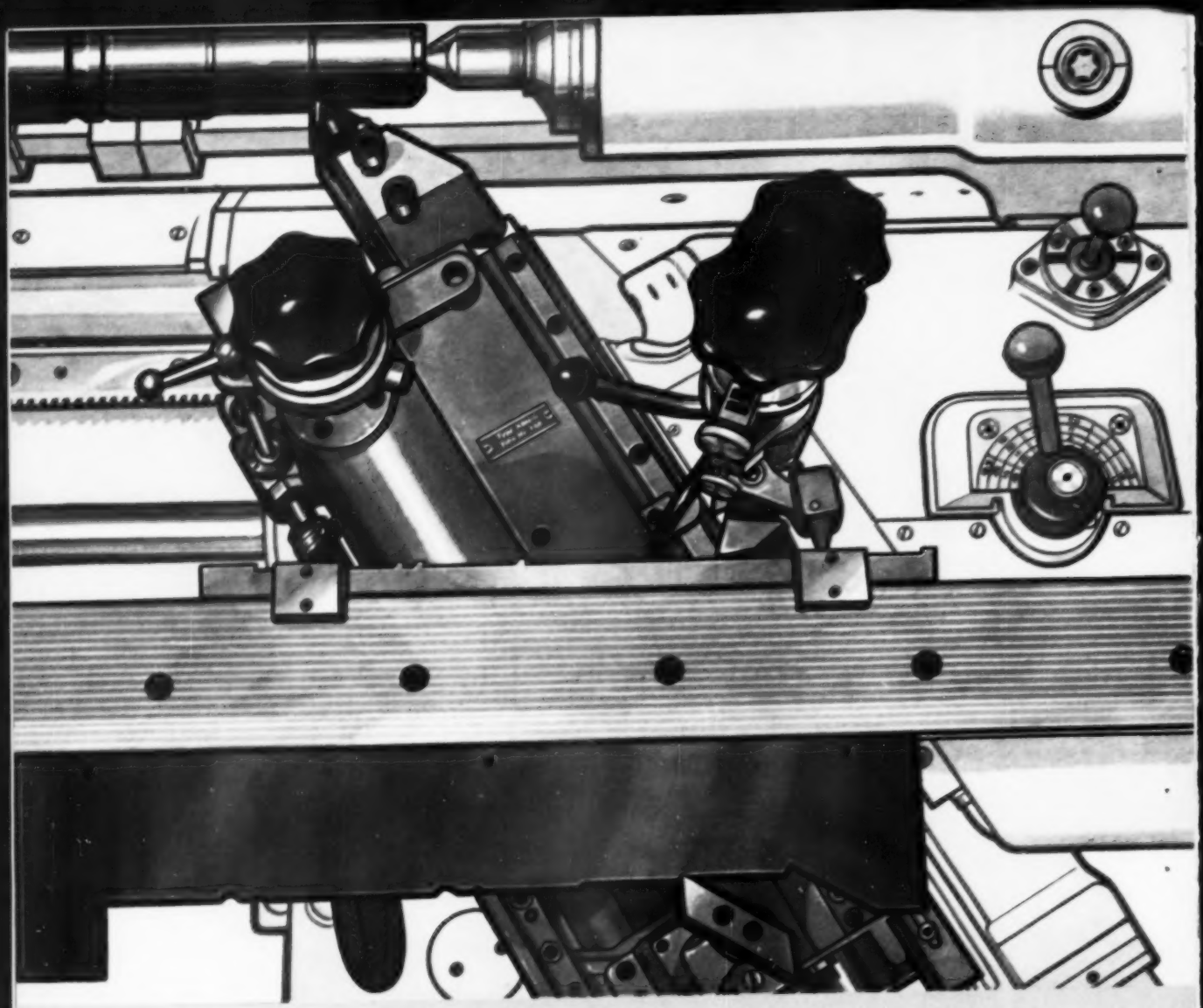


make higher production pay for itself

A New Britain four-, six- or eight-spindle chucker with open-end design, massive forming arms, large capacity (up to 15") will machine your castings and forgings faster at less cost. You can measure it in *income* instead of *cost* because New Britain Chuckers pay as they go. New Britain's new financing plan makes large initial investment unnecessary. New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Connecticut.

NEW BRITAIN CHUCKING MACHINE



you don't make money adjusting tools

With a New Britain +GF+ Copying Lathe you outproduce gang tool setups because you cut at maximum speeds and feeds for tool efficiency. No tool-wear worries! The single tool is changed in one minute. Every dimension is positively transmitted from template to work, making adjustment a simple matter of bringing one dimension to size — the others *have* to be right. New Britain-Gridley Machine Division, The New Britain Machine Company, New Britain, Connecticut.

NEW BRITAIN +GF+ COPYING LATHE

SPOT NEWS...

- **Progress in numerical programming will be reported in detail** at a meeting tentatively scheduled for February 25 and 26 at Massachusetts Institute of Technology, Cambridge. Planned as a special report on MIT's Servomechanisms Laboratory's work on automatic positioned tooling (APT), participants will include the Air Force, Aircraft Industries Association, MIT, and private industry. Air Materiel Command-sponsored APT is an advanced technique using computers and numerical control to develop a part from its physical requirements starting at any point in space.
- Look for an overhaul of government defense buying practices soon. Congress says there is "too much negotiated contracting and too little competitive bidding for the defense dollar." (Out of $24 billion defense purchases last year, only $3.4 billion was let on competitive bids.)
- **Latest word on the U S small cars**—General Motors will build its small car at Willow Run; Chrysler's will be built at Dodge's main plant in Hamtramck, Mich, with Dodge manufacture moving to the Chrysler-Jefferson plant in Detroit; and Ford will start production on its small car at its new Lorain, Ohio, plant sometime after mid-year.
- **Red China expects to produce 60% more types of steel products this year** than last, now claims to turn out upwards of 8000 varieties.
- **Navy's missile-firing atomic sub, USS Halibut, was obsolete** as it hit the water in its launching at Mare Island, Calif, this month. While the $36-million sub can reach any navigable spot on earth without refueling, it must surface to fire its missiles. The forthcoming Polaris atom sub, on the other hand, can fire without surfacing.
- **Punched-card data may be transmitted over ordinary telephone lines** with a new Western Electric-developed system. Caller inserts a punched card into a small "reader" beside his phone, and data is automatically reproduced by a receiver at the other end of the line. System will be rented at an average of $5 a month for the reader, $25 a month for the receiver. Possible applications: shop control on materials and parts, placing of long-distance orders to warehouses, personnel-record and inventory control. Manufacture is now being licensed to other firms.
- **Chrysler's new lightweight, 19.39-miles-per-gallon gas turbine** (see p81) is reportedly made from "non-esoteric" machinable materials that can withstand 2000 F. Examples: combustion chamber and turbine blades are made from ferrous metals.
- **U S industry and India now have 117 proposals for joint ventures** into manufacture of machine tools, automotive repair, bolt and nut manufacture, and the making of bicycles and textile machinery.
- **Plastic wheel and rim assembly for one-ton vehicles** has been developed by Kelsey-Hayes for Detroit's Ordnance Tank-Automotive Command. Material is 1-in. epoxy-coated fiber fabricated in a matched-metal mold. Weight saving is 30 lb, and wheel is said to be stronger than metal. Also being researched by Detroit Ordnance: plastic bogey wheels for tanks, amphibious vehicle hulls, transparent bullet-proof tank turrets.

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DIAMOND WHEELS

THE COMPLETE LINE IN EVERY RESPECT

Man-Made or Natural Diamonds

All standard shapes, sizes, diamond depths and concentrations... man-made or natural diamonds in resinoid and vitrified bond. Natural diamonds also in metal bond.

The new "man-made diamond" wheels, especially popular for grinding cemented carbides, average up to 35% more efficiency on the basis of cubic inches of carbide removed per cubic inch of wheel wear.

Specify "man-made diamonds" from SIMONDS . . . and get the best in diamond wheels for carbide tipped tools, chipbreakers; electrolytic grinding, surface grinding, lapping and hand honing.

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Proven products
Dependable know-how
Quick supply

WASHINGTON...

Changes in the budget...

The new fiscal 1960 budget calls for a $145-million increase in defense expenditures to $40.9 billion. The money will be spent on fewer, but more advanced weapon projects.

Overall spending for military hard goods will drop from $14.2 to $14 billion, with planes taking the bulk of the cut—from fiscal 1959's $7.3 billion to $6.3 billion.

Missile spending, on the other hand, will rise from $3.3 billion to $3.8 billion, while shipbuilding will stay steady at $1.7, and other military hard goods remaining at $2.2 billion.

Government spending for research and development will rise from fiscal 1959's $3 billion to $3.4 billion—principally because many items formerly classed under production (such as weapon prototypes) are now listed as R & D.

For fiscal 1960, 1610 planes will be ordered by all the services (150 less than in fiscal 1959). Air Force will step up orders for the B-52, B-58 and KC-135, will order no more interceptors, fewer fighter bombers.

Navy will order no more fighters, and fewer attack (small bomber) planes. Army will increase its orders for turboprop observation planes, will cut down on helicopters.

Titan and Minute Man output will be stepped up. More money will be allotted to the Jupiter and Thor programs, but no more will be made after fiscal 1960. Bomarc, Nike-Hercules and Hawk missiles will get more funds. The Redstone missile will be phased out.

Electronics and communications money will be upped substantially, especially for the Ballistic Missile and Early Warning System.

Rocket engine trend...

Government experts report that some solid-propellant rocket engine makers are tending to do more and more of the metalworking on the propulsion plants, predict that this trend will continue from here on out.

Behind this trend is the growing shift in the makeup of the rocket propulsion industry: the phasing out of air-breathing engines, the anticipated decline for liquid-fuel rockets for missiles, and the rapid growth in solid propellant rocket systems.

For the air-breathing engines and the liquid-propellant rocket engines, there is a heavy demand for complex machinery. One Pentagon official estimates that 90% of the cost for a liquid-fuel rocket engine goes for the metalwork, the remainder for chemical propellant material.

For solid-fuel rockets the breakdown is roughly 50-50 and the metalwork requirement less complex. And an important factor to remember is that few if any more missiles with liquid-fuel engines are likely to be authorized. The role of mechanical and metalworking companies, heretofore dominant in missile propulsion, is therefore diminishing. The chemical process companies who hold the prime contracts for the solid fuel rockets, are taking over. And some of them apparently want to have more control over the metalwork requirements as a means of cutting costs.

First fixed-price pact...

A ballistic missile milestone will be achieved soon when the Air Force awards its first fixed-price type contract to a major associate contractor—name unknown—on the Atlas project. This is important evidence that quantity output of the missile is under way and that production costs —at least for one sub-system of the missile— have been more precisely estimated than ever before.

The significance of the fixed-price contract is this: The contractor's allowable profit will rise from some 4% of costs to as high as 12% of the selling price. Up to now, Atlas—like other R&D projects—has been on a cost-plus fixed fee basis. The fee—in effect the profit before taxes—is normally 4%.

Fixed-price-type contracts are ordinarily not awarded until the production phase of a project has been reached. On such contracts, the producer's profit normally comes to at least 8% before taxes.

If incentive clauses are inserted, the profit can rise to a maximum of 12% before taxes. The incentive clause provides a bonus for beating delivery dates or for substantially scaling down unit costs. In all likelihood, the first Atlas fixed-price contract will have such a provision. The contractor normally can hold on to 20% of the costs saved on an incentive fixed-price contract —until the total gross profit exceeds 12% of the selling price.

How a leading automotive manufacturer Snyder-izes for the Soaring Sixties

HOLDS PISTON WEIGHTS ± 2 GRAMS AT 600 PER HOUR

This Snyder transfer machine automatically weighs die cast aluminum pistons and mills them to tolerances of ± 2 grams at double the rate of the previous method. Here's how it turns out 600 parts per hour:

Pistons are transferred bottoms-up to orienting station.

Pistons are oriented in relation to the wristpin hole offset.

Pistons are spun right side up (below at right) while they are advanced to weighing station.

Precise overweight is transmitted by memory system to weigh-mill station during transfer.

A 3¼" milling cutter removes excess with the piston clamped in position.

Gaging station re-weighs pistons to check weight. Deviation from part tolerances stops machine.

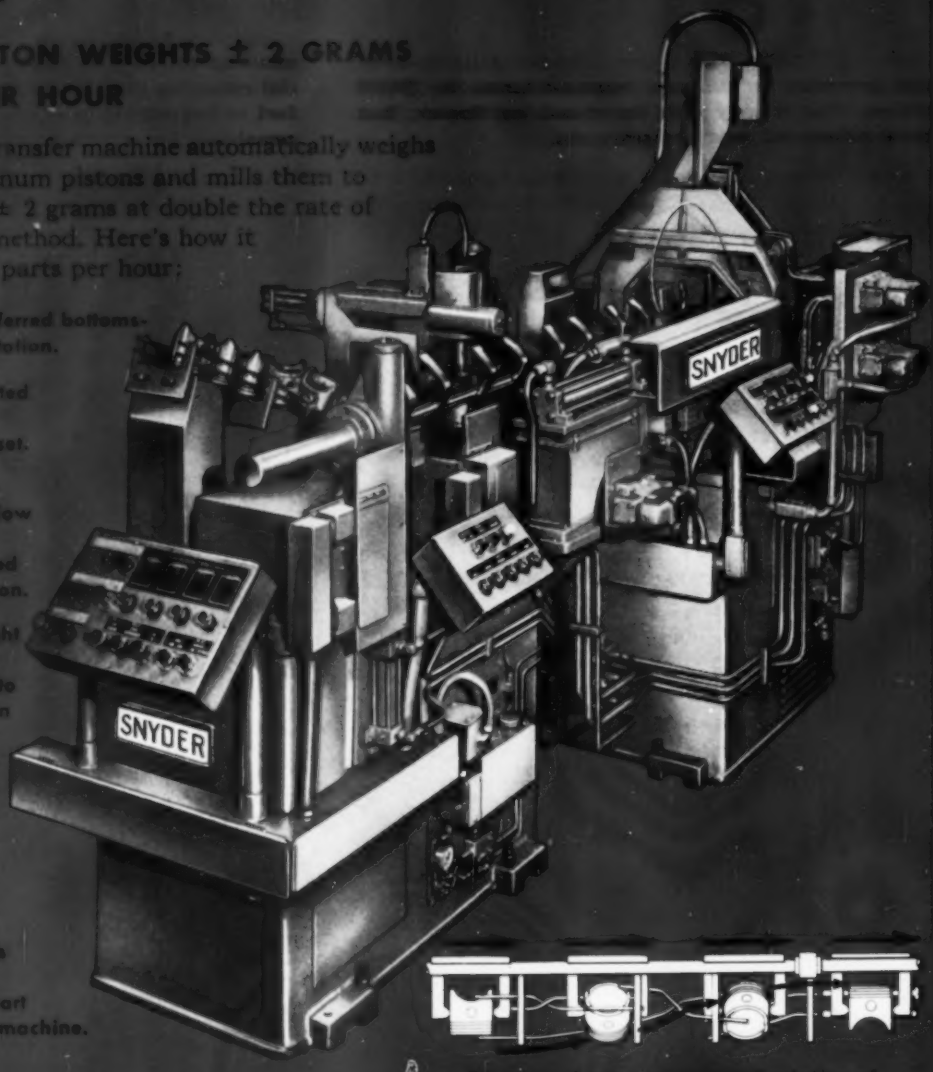

Diagram shows one over end rotation of piston as it passes through spiral rails.

Do your manufacturing cost problems revolve around parts handling, gaging and assembly as well as machining? Ask us to show you the benefits of SNYDER-IZING FOR THE SOARING SIXTIES. For a resume of SNYDER special machines engineered for profit opportunities, send for our new brochure or phone.

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DETROIT...

Optimism sticking...

Every day brings new reports of sales and production records being set and then broken. Even healthier is the fact that truck production for the year to date exceeds last year's total, despite loss of International Harvester output. In nine weeks, the strike there has cost about 20,000 units, but boosts in Chevrolet, Ford, and Dodge production have made up the difference.

Rambler production schedules for the first three months of 1959 call for building about 100,000 units, a figure more than double 1958's record. Overtime and Saturday work will continue, and the company, having found alternate sources, anticipates no shortage of glass.

Chrysler, on the other hand and as usual, was not so lucky. The continued stalemate at Pittsburgh Plate Glass forced shut-down of assembly operations on January 16.

Ever-climbing Ford sales, matched by a daily production rate 56% higher than the average during the first eight months in 1958, prompted putting the Division's new Lorain, Ohio, assembly plant on a double-shift basis. Some 1300 additional employees will be hired within the next few months to double production there.

At the other end of the price scale, Cadillac wound up December with an all-time month's record of 15,236 retail deliveries. The company's single assembly plant is on a two-shift basis and each of these may soon be extended to nine hours.

Oldsmobile, producing at the rate of 10,000 units a week, is still pacing the medium-price field and because of strike-induced Plymouth doldrums has captured third sales spot overall. Nearest competitors, volume-wise, are Pontiac and Buick.

Turbine breakthrough...

It has been over two years since much has been said about development of automotive gas turbines, but recent news more than makes up for the seeming gap in progress.

The good word is that Chrysler has refined its design to where it now averages 19.39 miles per gallon—highway tested at realistic speeds in an otherwise stock 1959 Plymouth. Of equal importance is the fact that it now weighs about 400 lbs less than today's V-8 engines—and no really critical materials, such as cobalt, are used in its construction.

The breakthrough in fuel economy came from patient, bit-by-bit boosting of burner efficiency to where it now approaches the point of complete combustion at all speeds. Added to this is a substantial boost to 90% in the efficiency of the regenerator (the unit that salvages exhaust gas heat). Finally, compressor unit efficiency is raised to 80%.

Significance of the Chrysler advance is that mass-produced, turbine-powered passenger cars could be as little as two years away. But what may keep them forever from becoming a reality is, as a top engineer from a competing company put it, "the terrific element of risk involved. The power plant must be used in the largest-volume car to bring down costs, but if it isn't accepted by a public that has known nothing but reciprocating engines, the resulting 'flop' could easily put the manufacturer completely out of business."

Turbine vs diesel trucks...

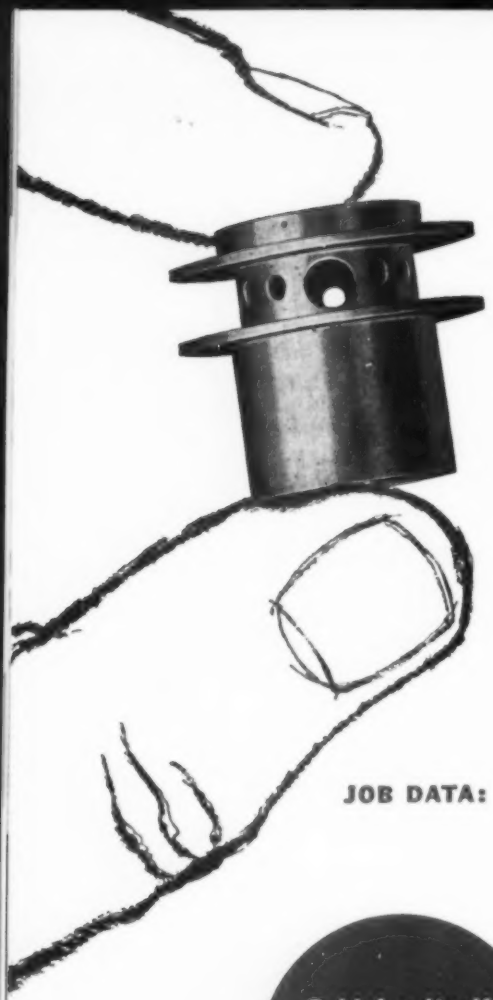
General Motors and Ford, in their turbine developments, have stressed usage in trucks, buses, and tractors as less risky alternatives. This leaves one to wonder if the relatively small volumes involved here would permit pricing in line with already proven diesels. Also, as Chrysler Project Director George Huebner points out, there is no reason why a basic and successful passenger-car turbine cannot later be adapted to specialized fields.

The timing, therefore, is more a matter of economics than of engineering. Huebner flatly states that "the remaining technical and development problems do not appear nearly as difficult or complex as they did even two years ago. There is no doubt that we are close to the time when automotive manufacturers will be able to chose between reciprocating engines and gas turbines."

GM's "Whirlfire" on way...

Meanwhile, General Motors is following through on its decision to produce limited quantities of the GT-305 "Whirlfire" engine. It is currently slated for ordnance testing in a Cadillac-built M-56 light tank and in a heavy-duty Chevrolet truck. Company spokesmen say that the unit could be built in quantity at a price no higher than for an equivalent reciprocating engine.

The other factor, as Huebner himself points out, is that automotive research staffs are just as interested in advancing the piston engine. How much these will be improved in the next few years will also have a strong bearing on whether or not the turbine will ever be a volume reality.



51% More Production

when drilled with the

BENCH MODEL BURGMASTER®
Turret Drilling Machine

JOB DATA:

Part: Gas furnace pilot burner head.

Location: General Controls Co., Glendale, Calif.

Material: Type 2202 stainless steel.

Operation: Drill 10 holes No. 56 drill size.
Drill 1 hole No. 42 drill size.
Drill 1 hole No. 37 drill size.

All hole positions indexed radially around jet axis. Turret is double tooled.

Former Method: Production—58 pieces per hour, standard, on a 3 spindle gang drill. Fixture was progressively moved from one spindle to the next on 8' table.

Burgmaster: Production—88 pieces per hour, standard, with actual production running 130% over standard. Operator fatigue greatly reduced. All holes now drilled from one operator position on a stationary rotating fixture. Floor area requirements per machine reduced 50%. Based on savings alone this machine paid for itself in less than 5 weeks!

Paid for itself out of savings in less than 5 weeks!

THE BURGMASTER TURRET DRILLING MACHINE speeds all second operations—*center drills, drills, reams, taps, spot-faces, countersinks,* and *counterbores!*

SELF-INDEXING—Turret instantly power-indexes to successive station after each individual operation is completed!

6 STATIONS—Only one live spindle! Each spindle operates at its own predetermined speed. Two complete ranges cover 350 to 6200 rpm.

¼" CAPACITY IN STEEL—Larger hole sizes in softer materials.

For *more* parts per hour, for *lower* costs, put your second operations on a BENCH MODEL BURGMASTER TURRET DRILLING MACHINE! Here's a tool that not only produces more parts faster . . . it costs *far less* than conventional equipment often used for the same job! Write for circulars and specifications!

BURGMASTER BENCH MODEL 6 SPINDLE AUTO INDEXING TURRET DRILL & TAP MACHINE

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AIRCRAFT and MISSILES...

TRENDS

Long Islanders team up...

New York's Big Three aircraft companies—Republic, Grumman and Fairchild—are joining forces "to project Long Island more strongly into new missile and space programs."

The teamup will be in the form of an industrial mutual aid pact, designed not to interfere with the companies' individual programs, but rather to enable them as a team to undertake programs too extensive for each to handle separately.

In other words, the Long Islanders feel that far too many fat missile contracts are heading out West these days—and they want "in."

And while the three firms are relative late-comers in the race for space, each has a fine record of achievement in the production of military aircraft, missiles and missile components. Giving a big boost, too, to the combine's space age facilities will be Grumman's new Avionics Engineering Laboratory and Republic's proposed $14-million Space Research Center—plus, of course, the three firms' huge production plants on the Island.

This could be a much-needed shot in the arm for Fairchild's ailing Deer Park facility, where 2000 out of 2600 employees have been thrown out of work by the abrupt and complete termination of a J-83 turbojet engine contract with the Air Force—just as the engine was going into full production.

Fairchild today is regearing contract-less Deer Park to become what is probably the best-equipped metalworking job shop in the country. The three-year-old, $12 million facility is jam-packed with the latest in sheetmetal working, heat treating, plating, forming, welding and machining equipment—all of it now available on a contract basis to other metalworking companies.

Of course, Fairchild would welcome a new aircraft or missile contract to keep the plant going, but failing that, Fairchild still has no intention to close down or sell the Deer Park facility. Rather it is offering Deer Park as a shop ready to do anything from simple machining to complete production of a complex jet engine.

To this end, Fairchild is keeping 600 of its former 2600 workforce on the payrolls. But the recently released 2000 workers were hand-picked by Fairchild to staff one of the country's most modern plants. As a result, other aircraft companies and metalworking plants in the Long Island area (including Grumman and Republic) have been snapping up engineers, technicians and skilled machinists and other production workers. They have been helped considerably by Fairchild's hastily set up employment center at Deer Park, where lists of laid-off employees are available and interviews are arranged. To date, Fairchild reports, several of its engineers and technicians have had two or three offers, as have top machinists and skilled workers. But semi-skilled workers, as elsewhere are more difficult to place.

Northrop changes its name . . .

On February 2, Northrop Aircraft Inc, Beverly Hills, Calif, will become Northrop Corporation. The company's Northrop Division, Hawthorne, Calif, will take the name Norair.

Idea is to shed the "aircraft" connotation in an age when guided missiles are taking over from manned planes as our principal weapons, and at a time when the first manned space craft has been announced as only two years away. Too, Northrop is today diversified into the electronics, electromechanical and optomechanical fields.

Other division names—Nortronics (Hawthorne and Anaheim, Calif), Radioplane (Van Nuys, Calif, and El Paso, Texas), and Northrop International (Beverly Hills) won't be affected.

Industry highlights...

- Chance Vought, Dallas, and Lockheed's Marietta, Ga, plant will share a "multi-million-dollar" contract for manufacture of the B-70 "Valkyrie" bomber. Weapons system manager is North American Aviation. Chance Vought will design and manufacture horizontal and vertical stabilizer sections for the Mach 3 intercontinental bomber, while Lockheed-Marietta will design and build the aft fuselage section. The new contract helps fill the gap left at Chance Vought by abrupt cancellation of its Crusader II jet fighter and Regulus II missile. Lockheed-Marietta expects its new Valkyrie contract to keep the plant busy for "several years" and to stabilize employment there.
- Umbaugh Aircraft Corp of Ocala, Fla, plans to begin production of civilian helicopters by January of 1960. Initial output is slated at 100 helicopters a month, and employment will be "Not less than 3000 people." The plant will be tooled to produce 1000 units a month eventually.
- Convair-Fort Worth will research titanium sandwich panel construction for the Air Force, and will develop manufacturing methods and tooling to produce sandwich quantity.
- The Army's surface-to-surface "Sergeant" missile, designed to replace the present, heavier "Corporal," is entering the developmental hardware stage at Sperry-Rand Corp's Sperry Utah Engineering Laboratory.

CHUCKING METHODS CAN BECOME OBSOLETE TOO!

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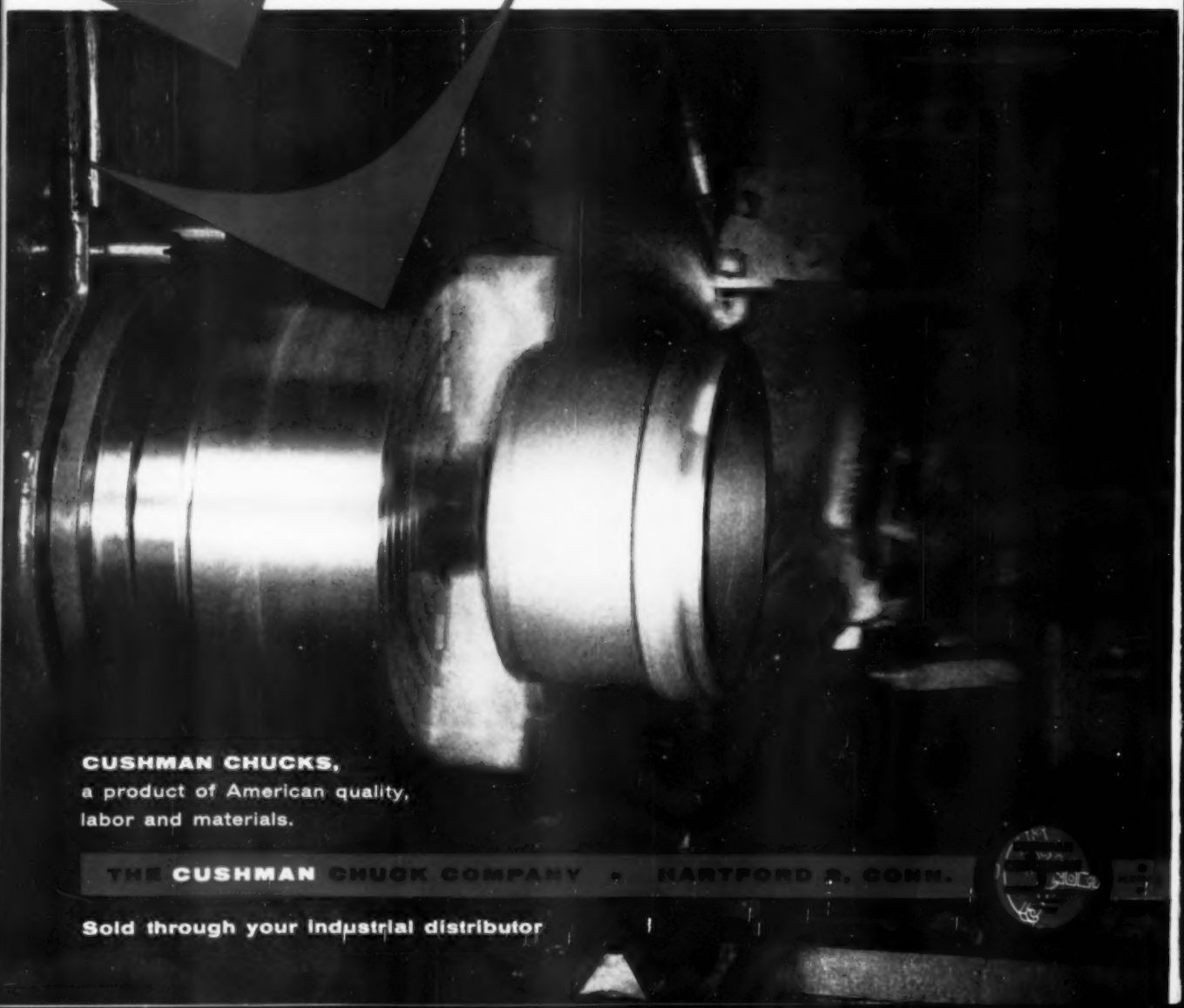
AIR OPERATED CHUCKS

Designed and built to fully meet modern machining techniques and machine tool requirements, Cushman Chucks permit the use of higher speeds with heavier feeds, maintaining closer tolerances with continued repetitive accuracy and result in maximum workholding efficiency with the greatest savings in time and costs.

For profitable machining through the use of precision chucking equipment, specify Cushman Air Operated Chucks.



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a product of American quality,
labor and materials.

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MACHINE TOOLS...

TRENDS

Orders show marked improvement...

Things are looking better in machine tools. For one thing, December was a bigger month than anticipated. Net new orders for cutting-type machines were almost $28 million, compared with $20.7 million in November. Total net orders for forming-type machines added up to $13 million, as against $8.4 million the previous month.

Altogether, net new orders for cutting and forming types of machine tools amounted to more than $41 million, topping March by $5 million and making December the biggest month of '58.

The upturn in December apparently was not just a "flash." It had more of a solid basis than that. It now is being hailed by many builders as the forerunner of sustained improvement.

Demand for specials looking up . . .

Makers of special machines, especially transfer types, report a much better outlook. One builder is processing more inquiries than in any period since 1954 and has the largest force of engineers in history working on proposals.

And only a small part of pending business is for rebuilding. That in itself is a marked change.

Chrysler's small car engine program is one of the biggest current jobs. Decision has not yet been made on an aluminum block. Chrysler is said to be asking for June deliveries, but that is regarded as almost impossible to meet.

Chrysler's transmission tooling program also is up. Detroit Transmission Division of General Motors is in the process of revamping the design of the hydromatic unit; and this tooling program is likely to be timed for 1961 models. The so-called transaxle jobs, which have been on and off, are reported dead.

The American Motors expansion program for Kenosha is much in the limelight.

Detroit buying of machine tools in the months ahead promises to be fairly good, after a long drought. But it will not be anything like the plush volume of a few years ago.

Forerunner of better times . . .

A prominent builder, whose business in the past has consistently risen a little ahead of the industry's, has recently increased its production rate and soon will move to a still higher level. It is again on a five-day week and has been calling back men. Its orders have been climbing since September.

Another company has shown a 10% improvement in sales each month for the past three months. Inquiries are in greater volume than in some time and are from excellent sources. Its field representatives are optimistic. The company has put back to work a number of shop people.

Another important builder predicts that it will do much better the first six months of this year than in the similar period of 1958. It already has sold a number of tape-controlled machines recently put on the market, with users sure that they can save money with them.

Still another builder states that January orders are good and that it expects business to improve steadily through the year.

Sales in January have been at as high a level as in December and the December total was double that for any other month in 1958, a midwest machine tool builder reveals. It is convinced that sales the next six months should be good.

Progress on building blocks . . .

Substantial agreement on the building block concept of making machine tools was reached between 26 builders of special machines and four big users at a series of meetings in Detroit extending over a period of four days. Please turn to p95 for a detailed story on the meeting and reactions to it by both builders and users.

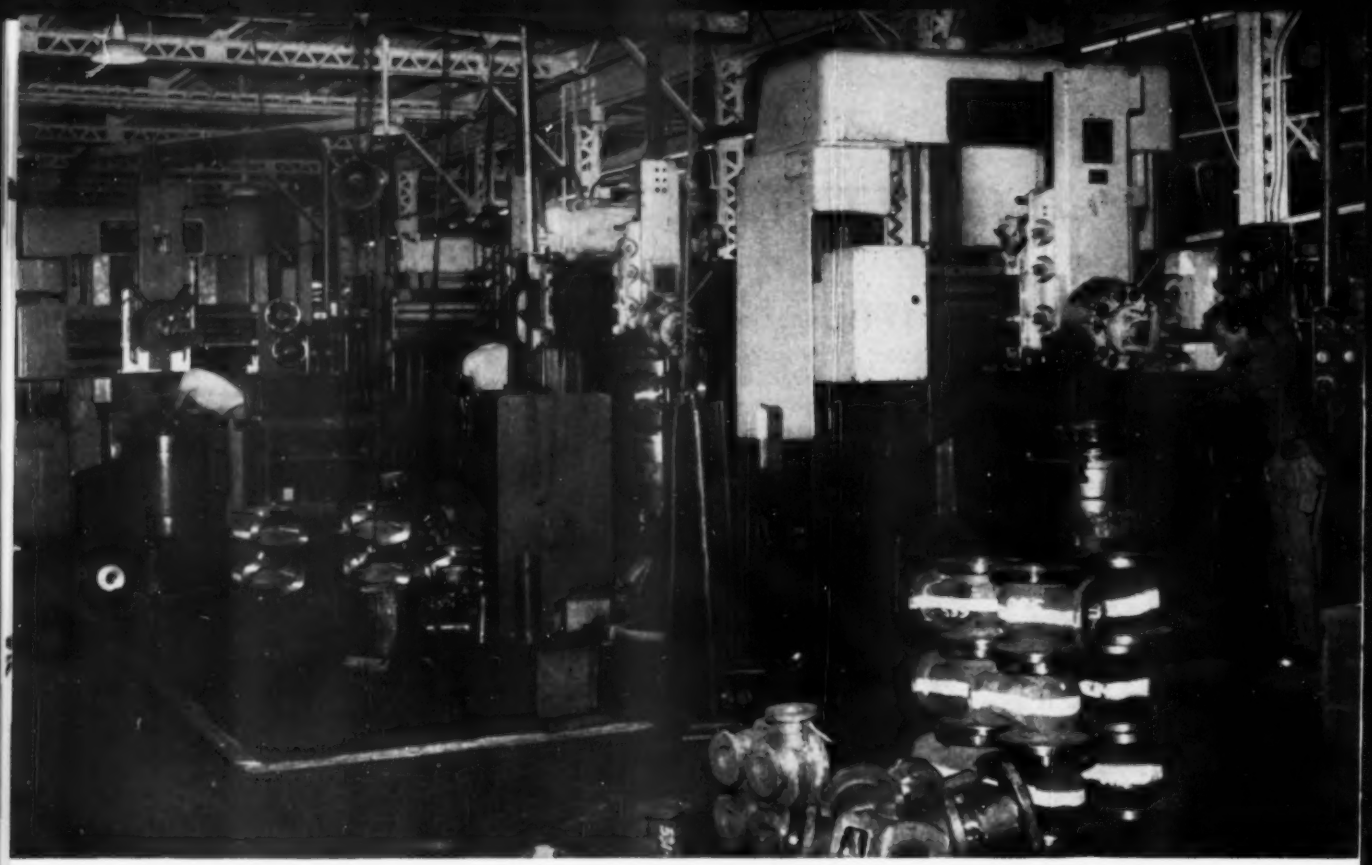
Convertibility will not help . . .

Convertibility of European currency into dollars, which has been expedited recently by actions of governments abroad, is not expected to bring any improvement in U S machine tool exports.

Most builders agree that the barrier to foreign sales is not dollars but prices. "Until we can get our prices down to within 10 to 15% of foreign prices instead of 50 to 100% above them," one builder declares, "we can't be competitive regardless of convertibility." The fact is that convertibility might further exclude U. S. machines from markets abroad. If India, for instance, can freely convert the rupee to buy machinery, it will do so in the country which offers the best bargain in machines. And that would not be the United States.

Tight import quotas still remain on machine tools from the dollar zone going into France. Jig borers, bevel-gear cutting machines and precision dividing machines are the only machines granted automatic import licenses by France.

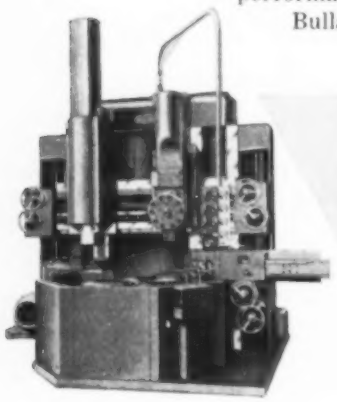
BF



"they're GOOD machines"

BULLARD

A veteran of 39 years with the Newport News Shipbuilding and Drydock Company, Mr. L. G. Webb, Foreman, further said "a large volume of valve bodies, hubs or levers for hydraulic turbines and various other parts to be machined are handled most efficiently on our Bullard Model 75 Vertical Turret Lathes." Replacing Bullard V.T.L.'s of an earlier design, which gave them excellent performance, this company has a battery of ten Bullard Cut Masters, Model 75, ranging in size from 26" to 66".



The same dependable day-in and day-out cost cutting performance delivered by Bullard Cut Master V.T.L.'s, Model 75, can be applied to your machining work — have a Bullard Sales Engineer show you the many benefits of replacing your outdated equipment.

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CIRCLE 179 READER SERVICE CARD

MATERIALS... TRENDS

Moly for missiles...

Said to be the first of its kind and significant to the missile field, a simple cylindrical casting of pure molybdenum has been produced by the Albany, Oregon Laboratories of the Bureau of Mines. Centrifugally cast in a graphite mold, the 30-lb charge was arc-melted in a water-cooled copper crucible under inert atmosphere. The casting is a hollow cylinder 4½ in. in dia by 8 in. long.

Pure molybdenum has been produced as compacts of metal powder and as arc-melted ingots but these shapes required further mechanical working to create usable parts. It is believed that the new process will permit casting moly to accurate shapes for use "as is." Credit for the development goes to the same laboratory that produced the first sizable castings of titanium and of zirconium.

Shiny outlook for metals...

As is usual at this time of year, the professional (and a few amateur) star-gazers are working overtime. And they are pleased—with justifiable reason—at the outlook for 1959 as compared with '58.

Alcoa tells us, for example, that a 5.5-million-car market in '59 will use 283 million lb of aluminum; that actual aluminum use per car is up 9% over 1958 models. Biggest single user will be Chrysler's Imperial Convertible with 121.24 lb per car. Use of aluminum in the average auto has grown steadily from 12 lb in 1948 to an estimated 51.6 lb in 1959.

A shift to aluminum engines, in a 5.5-million-car year, would require more than 500,000 tons of aluminum—32% of total US primary aluminum production during 1958. Efforts to get adoption of aluminum engines will be accelerated during 1959.

Other bright spots for aluminum appear in the container field and in construction materials. Meanwhile, it is finding increasing markets as an alloying element.

Magnesium, too, is being pushed as an engine metal—but its best hopes rest with the "small-car" engine as suppliers point to the Volkswagen. For other products, more selling effort can be expected in '59 with emphasis on magnesium's weight-saving virtues as well as the more readily worked new alloys. Magnesium can hope to gain, too, from increased use of aluminum. Probably the biggest single use of magnesium is an alloying element in the very useful magnesium-aluminum alloys. Use of magnesium tooling plate should accelerate as potential users are shown the values of its light weight and rigidity.

More nickel in money...

During 1958 the use of nickel in coinage increased by 50%. A quarternary coinage alloy of this traditional money metal was developed at the Mexican Mint and nickel-alloyed coinage returned to Argentina for all denominations; to Columbia for some denominations. Canada continues to use pure nickel for its five-cent piece. Europe still uses established nickel and copper-nickel coinages. A new cupro-nickel coinage was introduced in Spain. Cupro-nickel has also been adopted for new coinage issues in Ghana and Nigeria.

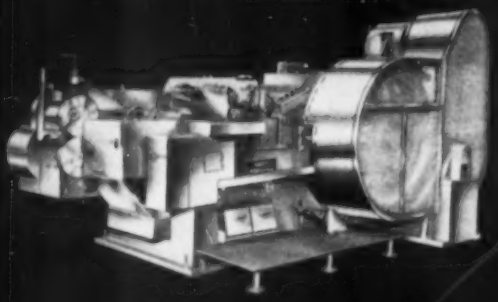
During 1958, US consumption of primary nickel in *engineering alloy steels* increased in the face of a reduced production rate for the steel industry as a whole. The most important new applications were found in heat-treated high-strength structural plates and shapes containing up to 3% nickel for bridges, pressure vessels, and hulls for naval vessels. Alloys containing up to 3½% nickel are used for low-temperature-service equipment; where temperature problems are severe, the new "nine-nickel" steels are used. Diesel locomotive roller bearings are made of nickel-chromium case-hardening alloy steel as part of the British Railways modernization program.

Copper 4 times stronger at 1800 F...

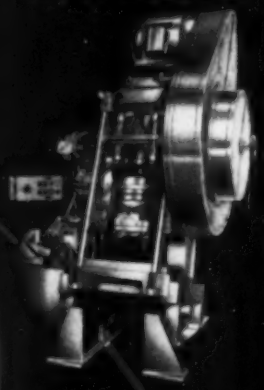
"Mixing" ceramic materials with metals by precipitating ceramic compounds out of molten metallic "solutions"—but trapping the precipitate in suspension—is the basis for a new metal alloying process. Developed by the University of Denver's Denver Research Institute.

Copper that is three to four times as strong as conventional copper at 1800 F, and aluminum three times as strong as conventional aluminum at 1000 F, have been produced at the Institute. Technique is to mix, for example, boron in one crucible of molten copper and thorium in another crucible of molten copper. When the two crucibles are poured into a single mold, thorium boride is formed as a precipitate. Quick cooling traps it in suspension. Called "melt-saturation," the ceramic is sufficiently dispersed to impart its high-temperature strength to the metal—a ceramic "framework."

COLD HEADING MACHINERY



POWER PRESSES



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WF-54

WHAT'S AHEAD... in Metalworking

TRENDS

Production heading upward...

Metalworking production is headed for higher levels in the weeks immediately ahead. Early predictions of a gain of 18% in volume of output this year over last are almost sure to be fulfilled. **Expansion of operations promises to spread** over a broad front. Demand for capital goods is getting off dead center and will show up in increased production as the year goes on. Consumer goods also are in for a period of growing sales.

Reflecting the optimism of their parent industry, automotive parts makers look forward to 1959 as a much better year than last. They say that production reports of automobile companies for the first 20 days in January have traditionally been a fairly accurate indicator of how the full year will go. And this year's beginning has been so good thus far that the automakers themselves have been revising their estimates of 1959 output upward almost week by week.

Stamping shops, too, report a "mild firming up of orders," due mostly to increased automotive and electronics buying.

Steel foundries are much happier over their business outlook now than they have been in many months. Prime reason is a big revival in orders for railway freight cars, which account for something like 35% of the total volume of steel castings.

From a virtual standstill in the first 10 months of 1958, new railway car orders have climbed to somewhere near the 10,000-unit mark.

Makers of gray iron castings report that they have more orders for estimates in their shops now than they have had in more than a year.

In many cases the quotes are in and patterns have even been made, but few actual order releases have come through—and most of those are for short runs from customers who have cut their GI castings inventories to the bone. Reluctance of buyers to place big orders seems to be an aftermath of the recession.

But basic steel, that traditional signpost of which way the metalworking economy is pointing, shows every sign of booming production. With tonnage increasing week by week, mill operators look forward to the market "busting wide open" any day now.

One reason for this is that a major automobile manufacturer has ordered its suppliers to lay in enough steel in the next six months to keep the auto company lines rolling through October.

If one automaker does this, steelmakers are convinced the others will follow suit—just to keep from being shut out of the market.

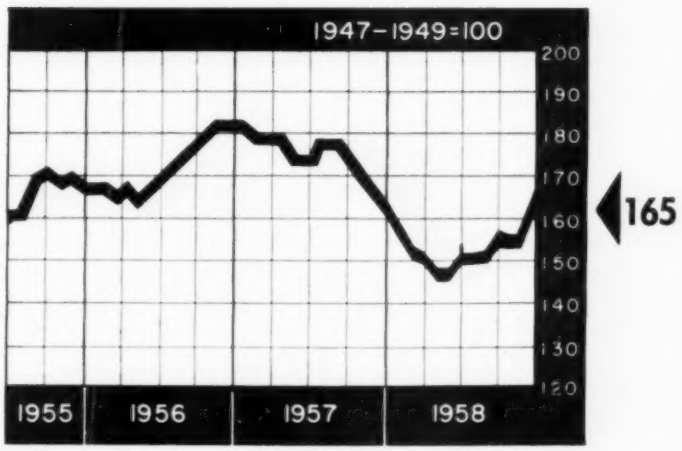
The fear is, of course, that a major steel strike in midyear could cripple automotive production for weeks or months.

The resulting buying boom, which steelmakers regard as almost inevitable, should shoot steel output up to pre-recession boom levels for at least six months——and probably longer.

Steel warehouses report a steady improvement in turnover of industrial products in the last two months. Warehouse inventories are now steady at about 3.3-million tons, a six-month supply at current turnover rates.

Sheet and strip are now turning over at a rate of three times a year, compared with twice a year this spring. Plate is in 9½ month supply, compared with seven to eight months last March.

There is a six-months' supply of bar on hand, as opposed to 7-8 months last March, and structurals are in seven-month supply.



AMERICAN MACHINIST INDEX OF METALWORKING PRODUCTION

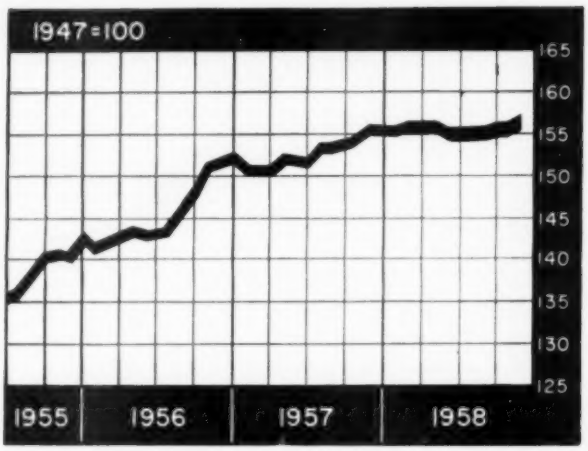
BASED ON MANHOURS WORKED IN THE FIVE COMPONENTS

	DEC Estimated	NOV Preliminary	OCT Revised	NOV Year Ago
Total Index	**165**	**163**	**169**	**169**
Machinery	131	130	142	
Electrical Machinery	189	177	199	
Autos	148	92	149	
Other Transportation	305	340	292	
Other Metalworking	140	140	145	

TRENDS WHAT'S AHEAD... in Business

AMERICAN MACHINIST INDEX OF METALWORKING PRICES

	DEC Estimated	NOV Preliminary	OCT Revised	NOV Year Ago
Total Index	**157.7**	**157.5**	**156.3**	**155.9**
Metalworking Machinery	181.2	181.6	183.0	
Other Machinery exc. Electrical .	167.8	166.5	166.1	
Electrical Machinery	158.8	158.8	157.0	
Fabricated Metal Products	148.3	146.7	146.5	



Everything's recovering but manufacturing employment...

Almost every important indicator of business, with the exception of manufacturing employment, has bounced back to or near previous high marks. The gross national product of the nation is estimated at an annual rate of about $455 billion for the fourth quarter of 1958, compared with the previous all-time high of $445 billion in the third quarter of 1957. Industrial production for the month of January is now estimated at a point or so below the previous peak level of 146 (1947-1949=100) attained in February 1957. Per capita income after taxes (in constant 1957 dollars) is only $20 below the second quarter 1957 peak rate of $1796 per person.

Employment in manufacturing, particularly in durable goods manufacturing industries, is the exception to the general rule of current recovery.

Manufacturing employment in December 1958 was more than 7.5% under the total for July 1957, the previous peak of business activity.

The fact that the recovery in manufacturing jobs is lagging behind the general business recovery is not a new development. The same pattern took place in the two previous post-war recession-recovery periods. In 1948-1951, it took 11 months from the bottom of the recession for factory jobs to get back to the prior peak. General business recovered within about 6 months. In the 1953-1955 recession-recovery, manufacturing employment never got back to the earlier peak, while business recovered to prior peaks within 9 months.

In the current recovery period, factory jobs, and, especially durable goods industry jobs continue to lag behind. After 8 months of business recovery since April, recovery in manufacturing employment has only accounted for about one-fourth of the earlier drop.

Substantial gains in productivity during the last half of 1958 accounted for most of the current growth in output, without sizable increases in the number of manhours of work.

WEEKLY BUSINESS INDICATORS

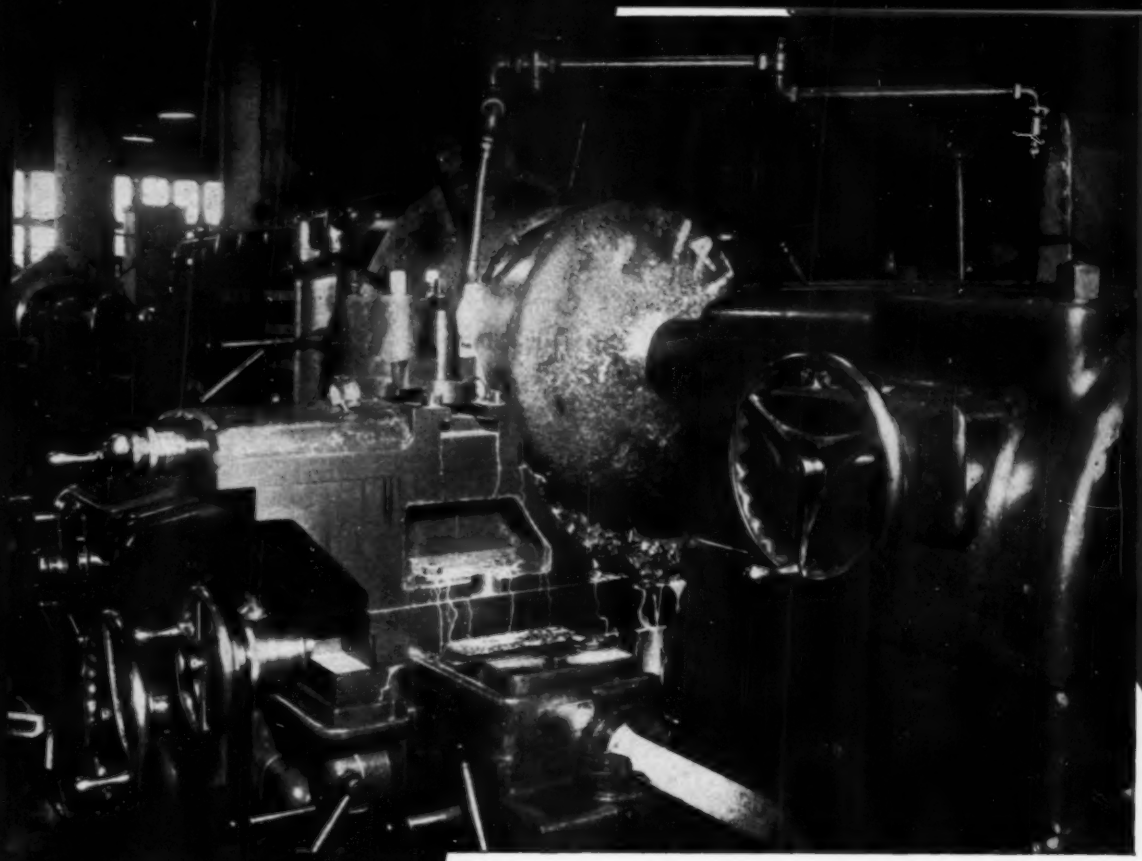
	Latest Week	Preceding Week	Year Ago
Business Week Index of Activity (1947-49=100)*	148.5	148.6	131.3
Steel ingot production (thousand tons)	2,123	2,085	1,538
Electric power output (million Kilowatt hours)	N.A.	12,364	12,506
Production of automobiles and trucks	165,811	117,862	146,024
Engineering construction awards (Eng. News-Record, millions)	$301.9	$259.9	$219.4

MONTHLY BUSINESS INDICATORS

	Latest Month	Preceding Month	Year Ago
Refrigerators sales (thousands of units)	278	295	246
Vacuum cleaners sales (thousands of units)	339	300	329
Washers sales (thousands of units)	404	423	369
Household electric ranges sales (thousands of units)	78	68	75
Radio production (thousands of units)	2,009	1,567	1,569
Television production (thousands of units)	496	622	662
Gear sales index (1947-49=100)	175.9	170.7	207.0
Foundry equipment new orders index (shipments, 1947-49=100)	118.9	64.5	145.3

* Seasonally adjusted
N. A. Not Available

CIRCLE 181 READER SERVICE CARD ►



"AMERICAN"

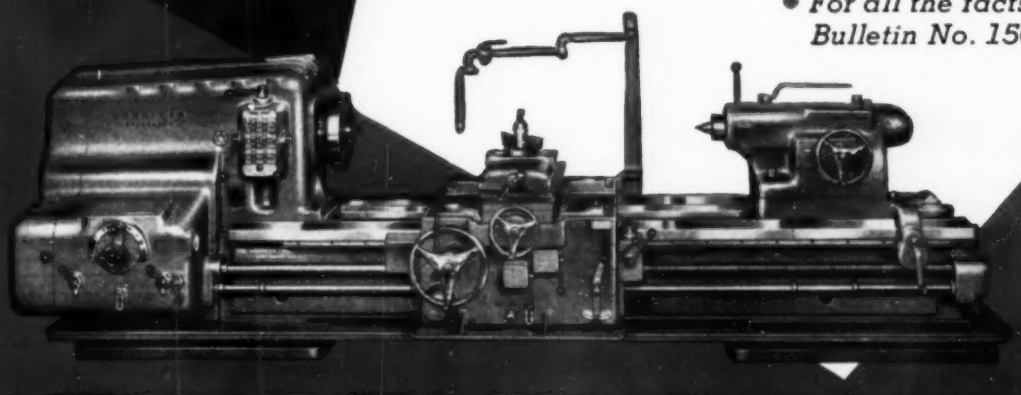
"Scalping" a $12,000 TITANIUM Ingot...

The operation shown by the accompanying illustration is "scalping" (cutting) the hide off of an ingot of pure titanium sponge. The ingot is 25" in diameter and the skin or hide that must be turned off is from ½" to 1" thick.

Due to the terrific cutting resistance of this "hide" low cutting speeds and exceptional ruggedness and rigidity are essential to satisfactory tool life.

Because power, rigidity, ruggedness and inherent stamina are outstanding characteristics of "American" Pacemaker Lathes they have been selected for this severe service by all of the major titanium fabricators.

• *For all the facts ask for Bulletin No. 150.*



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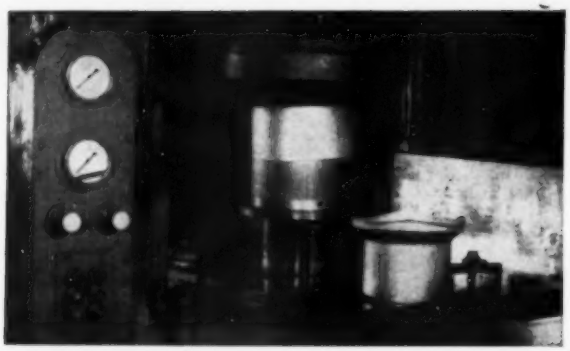
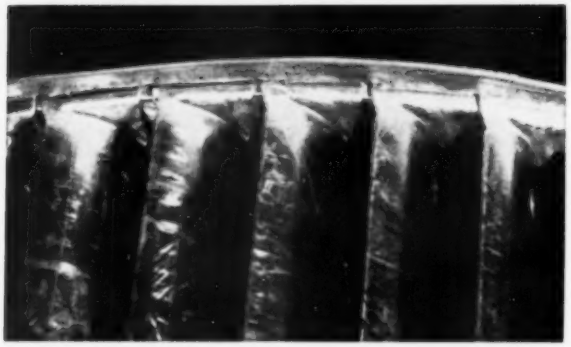
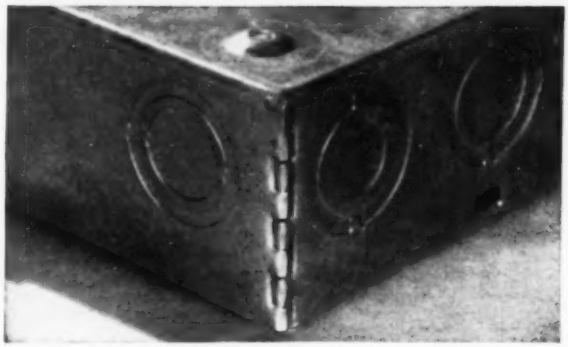
LATHES AND RADIAL DRILLS

Draw, Form, Interlock or Pierce Armco ZINCGRIP Steel— Its Special Zinc coating stays on







Workable zinc-coated Armco steel offers opportunities to cut production costs, add sales points to your products.

More than 22 years' experience in metalworking shops has proved that Armco ZINCGRIP® can be worked to the limits of the base metal without flaking or peeling of the special hot-dip zinc coating.

Cuts Production Costs

The ductile, adherent coating on ZINCGRIP means you don't have to baby it in the shop. In sheets or coils, it can be fabricated readily on modern high speed production equipment. And mill-coated ZINCGRIP often makes it possible to eliminate costly painting or plating operations on parts that must be protected from rust.

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American Machinist
MAGAZINE OF METALWORKING PRODUCTION • ESTABLISHED 1877

The One Thing They Haven't Learned

"What did you learn from the recession?" is the title of a bulletin circulated recently by a business association management firm. It is a pertinent question.

During the plush years of the 1950's most companies fell into slovenly and expensive practices. Their volume of business was large and their profits came easily. No one worried much about costs.

There was little incentive...

to make major changes in products or to bring out brand-new ones. Why invite headaches with things going so nicely?

When the recession began to hurt, management's attitude switched quickly. Extravagances were recognized as such. They extended all the way from too much inventory to a relaxed view by everybody of the job to be done.

Foreign competition, heretofore only a pinprick, suddenly was painful. European-designed and built products proved to be pretty good. And the Germans in particular worked their heads off to get somewhere. And they succeeded, often at our expense.

Much of their success...

can be attributed to the fact that they had to start from scratch when they were allowed to operate their industries again about 1950. They built new plants, designed and installed new machines and put new methods to work.

Government orders took on added importance during the recession. As the fishing along the Mississippi and Ohio and the Rouge yielded only minnows, manufacturers swarmed to the banks of the Potomac. Competition got rough. It also generated a surprising amount of resourcefulness and of inventiveness.

Thanks to the urgency of defense requirements, the aircraft and missiles industries became the trying-out place for new ideas. The result is that new materials, new processes and new products have been developed so fast that they almost tumble over each other.

The necessity for civilian goods manufacturers to lift themselves out of the recession has done for Metalworking as a whole what competition with Russia has done for the aircraft and missiles industries. Manufacturers have watched costs closely, have developed new products, have tried out new ways of producing goods, have put more thought than in years into streamlining their organizations.

All of this...

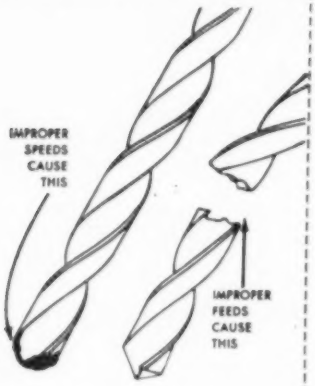
the recession has taught them. But as yet they have given little more than lip-service to one essential principle—that they must continue to keep their plants up-to-date with the latest production equipment if they expect to prosper in the years ahead. They have sadly neglected the replacement of out-moded machines.

The greatest threat to the future of any metalworking company is "withering obsolescence," as A O Smith Corporation calls it. The editorial pages of this issue are packed with descriptions of new machines designed and put on the market within the calendar year 1958.

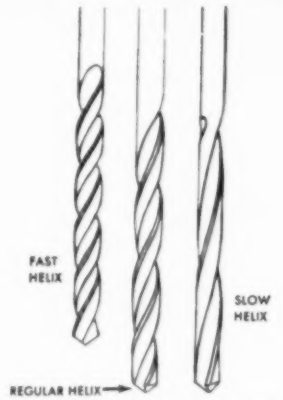
Metalworking companies could do nothing better to prevent withering obsolescence than to equip their shops with these machines. If they do that, they will be ready to compete successfully and profitably for the expanded business that looms in the 1960's.

Burnham Finney EDITOR

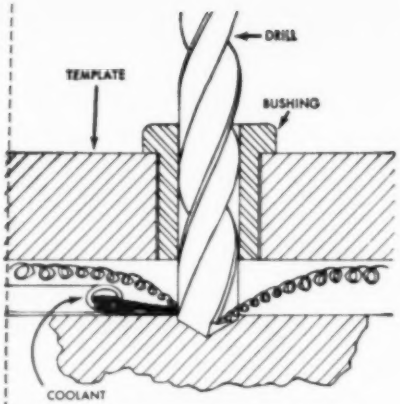
DRILLING TIPS YOU CAN USE



Improper speeds and feeds are responsible for most drilling failures. Never guess. Always use speed and feed suggested for specific materials and for size of drill being used. Always follow drill manufacturer's recommendation.



Use a drill with the helix best suited for the material. In general, **slow helix** is for brass, hard rubber, plastics. **Regular helix** for steel, forgings, castings, general purpose drilling. **Fast helix** for die castings, aluminum, zinc, copper.



When a bushing is being used, leave ample space between bushing and work piece for chip clearance. A space equal to the drill diameter is usually adequate. Apply copious flow of coolant in this space to assure reaching drill point.

FOR QUICK SOLUTIONS TO **ALL** YOUR DRILLING-REAMING PROBLEMS,
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BEST TIP OF ALL . . .

CHICAGO-LATROBE 416 W. ONTARIO ST., CHICAGO 10, ILLINOIS

Machine tool builders and big automotive users . . .

Agree on building block concept

Much progress toward acceptance by builders as well as users of a broad program for building-block machine tools came out of a series of meetings in Detroit on January 6-9, attended by 26 builders and sponsored by Ford, General Motors, Chrysler and International Harvester. At its inception the program is to be confined to in-line transfer machines, rotary index or dial machines, and way-type machines (including vertical and horizontal).

The whole concept of standardization was agreed upon, one auto maker revealed. And the consensus of builders is that the proposals in general look good, though certain specifications and detailed dimensions are yet to be worked out by a newly-formed committee comprised of representatives of eight builders. The building-block program is intended to provide interchangeability between major components of machine tools produced by various builders. Proposals discussed at the Detroit meetings developed out of a series of informal conferences with the 26 affected builders that were held more than a year ago. Before the current meetings, the auto companies sent their recommendations to the builders for advance study (for details, see *AM*—Jan 12 '59, p 107).

Agreement by big users of special machines to help small users in putting together a standardization program for general-purpose machine tools is one of the interesting developments of the Detroit meetings on building block machine tools.

"Close to Something Useful"

One builder at the conference stated that he "feels the standardization program is getting close to accomplishing something useful." But, he added, it might be a year or two before the recommendations could be put into general use.

Reason for this time lag is the need to modify certain recommendations —among them the idea of standardizing on sub-bases under *all* columns, horizontal, vertical, and angular. He said general agreement was reached that this procedure would be suitable for all except vertical columns. For the latter, the ways will be attached directly to the column instead of to a sub-base.

Although there are admittedly a number of advantages to the sub-base idea, from the point of view of versatility, cost is a big factor. Direct assembly of ways to vertical columns is cheaper.

Agreement was general that end-bases and other units attached to center-bases will be cross-keyed both ways instead of using dowels. Cross-keying simplifies locating in setup as well as locating in rebuilding. Once dowels are removed, accuracy in positioning is lost when reassembly of the unit is attempted.

Also, the working heights of bases will be increased from the recommended 40 in. to 42 in., measured from the base rather than the floor line—and mounting flanges that are too low or too short must be reconsidered.

"Toward Realistic Standards"

A second builder commented that "progress is being made toward realistic standards for both the machine-tool and the automotive industries." He doesn't feel that users are "pushing anything down the throat of the machine-tool industry." He mentioned a certain "mild surprise" at the air of general agreement shown during the meetings.

Most builders were pleased with the cooperative attitude shown by the users. For example, they dropped the idea of standard dimensions across the width of feed units when it was pointed out that the width of the saddle, mounting dimensions, and overall dimensions were much more significant.

Another builder agreed that "it sounds as though the program will really go through." He, too, added that the users were very receptive to comments, suggestions, and changes made by the machine-tool builders. Recommendations will be revised to become even less restrictive and will even take into account the objections voiced by those machine-tool builders (who appeared to be somewhat less than enthusiastic) as long as the end result—general standardization—is achieved.

This man believes that if machine tool builders want business they'll have to go along with what the customer asks for. He added his opinion that even with standardization, basic machine design remains in the hands of the machine-tool builder. The transition to a set of standards will not be painful to his firm—or others that have been making machines with standard elements.

Another builder shares *some* of this point of view. He will "make machines any way the customer wants them." They've always built machines according to the dictates of the customer and will continue to quote on them according to any standards that may be set up. However, he feels that while the concept of standards may be laudable, individual circumstances will necessarily determine whether or not they are used.

So much goes into the decisions regarding special machines: cost, space available in a plant, life of the job, and other factors, that he doesn't think standardization will be adopted right across the board. It boils down to whether or not a user can afford the flexibility provided by standardized dimensions. If not, he will necessarily ask that his machine be built to suit his particular needs.

Restricts Tool Development?

This same builder is firmly convinced that any form of standardization will be restrictive to the future development of machine tools. Standards, he feels, actually attempt to predetermine solutions that might not be the best for any individual problem. He pointed out that designers who formerly approached machine design from the point of view of the part and the process will now be "held to starting with a book of standards."

On the other hand, this same builder said, standard bases, wings, columns and the other areas in which standardization is sought are the smallest part of a design problem—most machine tool building time is consumed in designing the heads, fixtures and tooling!

According to a fifth builder, "standards *can* be developed, but they must take into account many of the factors that the users themselves want and which some of the current recommendations prevent." Among these factors is chip disposal. Standardized bases, he believes, prevent

Building blocks . . .

maximum efficiency in removal of chips.

Chip disposal calls for an "open" design while the recommended method of attaching bases eliminates the open base. He also disagrees on standardized column heights because columns must vary in height to suit different conditions of counterweighting. And, he feels that the standards do not take into account the effect of interchangeability on such components as electrical, hydraulic and lubrication units. Unless these are standardized, too, he believes that machines on which bases and other units have been replaced will be cluttered by these elements. In short, he also feels the standards have not yet been sufficiently worked out.

But, to this end, users themselves suggested (on the first day) that representatives of the machine-tool builders form a working committee to go over the recommendations and come up with a revised proposal. As a result, two men were selected each day, so that an eight-man committee of machine-tool builders has been established. They will start setting up final standards on mounting-hole patterns, and dimensions and will, of course, consider what can be done with the suggestions, objections, and other comments made during the four-day meeting.

Machine tool proposal contest launched

With an eye to "improving the art of preparing machine tool proposals" (quotations) the American Machine Tool Distributors Association is conducting a contest among its member companies and their employees to determine the best machine tool proposal devised in any of three categories: (1) for a general-purpose machine tool costing not more than $10,000, (2) for a general-purpose machine tool costing not more than $50,000, and (3) for a general or special-purpose machine tool costing $50,000 or more.

Contest proposals must be based on the "hard sell" premise, AMTDA specifies, and it must be assumed that the distributor has had sales engineer contact with the customer and that the customer is interested in the proposal. Too, the proposal must be based on the premise that the customer has previously purchased the same make and model of machine.

The new SAE: Technical

. . . No "arsenal approach" to Space Age procurement, NASA head says . . .

National Aeronautics & Space Administration does not propose to follow the "arsenal approach" to manufacture of space craft. That's the opinion of NASA Administrator T Keith Glennan, whose paper was read at SAE's Annual Meeting by Reaction Motors' Raymond Young. (Space chief Glennan was delayed by fog, of all things, and arrived an hour after the meeting had ended.)

NASA, he said in his paper, will design, test and operate prototypes, but private industry will do the building, not government plants.

The space business is not to be confused with the missile business, Mr Glennan emphasized — even though all but one of the present propulsion systems were originally designed for military purposes.

At the same time, the space business cannot be considered as the beginning of a substantial industry for some time to come. But NASA expects to develop specialized boosters and propulsion systems for space research. It will not continue to rely on borrowing the designs of the Armed Services. Thus new orders for the development of prototypes can be expected.

. . . SAE's new standard involute spline has many machining advantages

Advantages of the new SAE standard spline, which has an involute instead of a straight form, came under discussion from design, manufacturing and gaging viewpoints at the Society of Automotive Engineers' 1959 Annual Meeting in Detroit, January 12-16. The new, about-to-be-published standard will replace previous standards on straight splines that now apply only to service parts.

Involute splines permit rolling between master racks, said G H Sandborn of the Fellows Gear Shaper Co. Rolling is not usually practical for straight splines, but involute splines can sometimes even be used against a shoulder. The most common methods of cutting external involutes, however, are hobbing and shaping. When cut on a shaft which must have maximum rigidity, hobbing is generally chosen. Adjacent to a shoulder, or when runout is undesirable, involute splines are usually shaped, said Mr Sandborn.

For internal involutes, broaching is more economical than it is on straight splines, and Mr Sanborn expects an increase in this method.

Rotary shaving is possible for involute splines, though not for straight splines. Overlap between work and tool is normally required. This can be provided by leaving the OD oversize until after shaving, then reducing it. Another way to get the overlap is to cut and shave to extra depth. In practice, however, many involute splines are shaved without providing overlap.

Both hobs and shaving cutters for involute splines are generated tools with much greater inherent accuracy than the comparable cutters for straight splines.

From the gaging viewpoint, A S Beam, Vinco Corp, pointed out that the old standard on straight splines had never gone into inspection, nor did he know of any publication that dealt with the peculiar problem of applying involute practice to the special problems of straight splines and serrations.

Straight-sided serrations with 36 and 48 teeth are usually specified in the form of a call-out (reference to size and standard without detailed dimensions). Unfortunately, said Mr Beam, the successive changes have resulted in three standards covering the same nominal sizes and the same limits on major and minor diameters, but different pitch diameter limits.

The new involute standard gives detailed coverage of all areas of inspection of involute splines and serrations and is expected to make for a better degree of interchangeability —not only in the automotive industry but in other applications in which the new manufacturing standards are applied.

society for ground and flight vehicles

...Foreign metalworking competition will get tougher, says Ford's Harder

Major challenge to production management in the years ahead is cost cutting. Two reasons make this challenge so urgent:

- Competition is increasing from a foreign industry that is more efficient and harder working than in the past.
- Wage increases are negotiated in excess of gains in productivity.

These points were made by D S Harder, vice president of Ford Motor Co, at one of the production sessions of the annual meeting of the Society of Automotive Engineers. Del Harder, originator of the word "automation" and famed for his contributions in introducing automation to the automotive industry, was honored on the eve of his retirement from Ford.

Technological breakthroughs will provide tools of greater efficiency, such as new automation processes and computer uses, Mr Harder said. He emphasized the need for management to take steps now to modernize equipment instead of waiting for the next boom.

Terming the era ahead as the "Space Age"—a term he felt would be with us somewhat longer than some of the recent "ages"—he reminded his listeners that industry will remain earth-bound for some time to come. "We aren't likely to be building automobiles on the moon during my lifetime or yours, or even developing new dealers on Mars."

The challenge to cut costs takes on new urgency because we have poured economic aid into Europe in the form of machinery, technicians, and know-how. This has led to the startling economic recovery of these nations. Our success is satisfying from a political viewpoint, Mr Harder said, but from industry's viewpoint they have learned the lessons too well. As foreign industry becomes more efficient, the wage differential becomes more and more significant.

Turning to industry's responsibility in education, he cited the upgrading of skills and knowledge as an urgent task. "We can perhaps look to schools to give students a grounding in fundamental disciplines," he explained, "but it is unrealistic to expect our school system to teach a large segment of our population the special skills that our complex industrial operations will require. Industry itself will have to take over that task.

"The industrial manager in the years ahead will find himself giving more and more time and attention to personnel training programs."

The production executive, concluded Mr Harder, will have "the job of pushing harder and harder to cut costs and boost productivity. He will have to innovate and improve, concoct and contrive, and plot and plan as never before if we are to regain our vanishing technological advantage."

Introducing Mr Harder to the group, Anderson Ashburn, managing editor of AMERICAN MACHINIST, told the SAE members that Mr Harder had just admitted that he coined the word "automation" but not in 1947 as commonly supposed. He did it in 1935. Ashburn described Harder as "a production man who has truly become a legend within his lifetime."

New officers of SAE

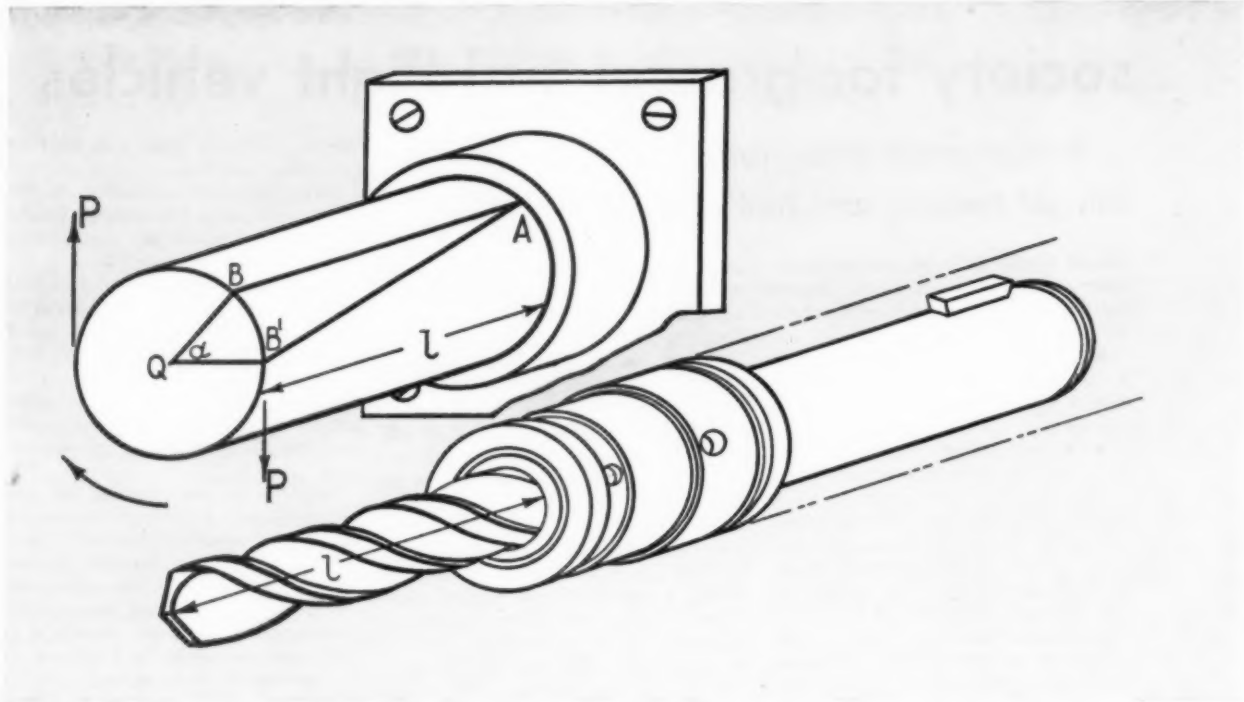
PRESIDENT
Leonard Raymond
Chief automotive engineer—research
Socony Mobil Oil Co
New York

VICE PRESIDENT-PRODUCTION
Anderson Ashburn
Managing editor
AMERICAN MACHINIST
New York

Malleable casting sales may jump 20% this year

Sales in the malleable-iron industry are expected to increase nearly 20% this year over 1958 levels, according to predictions made at the Malleable Founders Society's semi-annual meeting in Cleveland. Other major factors cited in the outlook for malleable:

- Increases of 20% are expected in all market areas except automotive, where the gain may go as high as 10%.
- About 75% of MFS's member companies will invest in capital improvements in 1959.
- Much of the industry's $6-million capital spending in 1959 will go for facilities to produce pearlitic malleable iron. Pearlitic production has increased 480% in the last 10 years —now accounts for 20% of all malleable output.
- Another big chunk of capital spending will go for R & D work.
- A 5-million-car year could boost malleable iron output to about 825,000 tons this year compared with 675,000 in 1958.
- Other areas in which sales gains are expected this year are construction equipment, railroad equipment, and heavy machinery.



Torsional twist . . .
. . . was found to be inversely proportional to the length of the drill in tests conducted by National Twist Drill & Tool Co. And it is axiomatic that less tool twist means higher tool rigidity

Tool life jumps 80 times with

Drill life can be increased many times by shortening the drill projection. This fact has been demonstrated by recent tests at National Twist Drill & Tool Co, conducted by Carl Oxford, director of research.

A 0.257-in. drill was shortened from 2⅞ to 1-11/16 in. and life between sharpenings jumped 8000%.

Nor is this an isolated case, according to Harry Conn, chief engineer, Scully-Jones & Co, who reports that in similar tests, **drill life per sharpening increased 300 times.**

A major loss of drill life can be traced to hardened bushings, which wear the drill margins and do not always improve drill alignment as they are intended. Other causes of drill inefficiency are low torsional strength in the drill, chatter that results partly from torsion-spring effects within the long drills, excessive tool bending, and lack of rigidity at the chisel point. Errors in drill-point grinding cause excessive side thrust, which results in margin wear, and a single dull corner can cause margin wear. Marginal wear usually takes place during the last 25% of the effective drill life.

Tests at National Twist Drill show that torsional windup affects drill life adversely (see chart). Less windup results in higher rigidity, according to Scully-Jones tests made without drill bushings. Angle of twist (see sketch) is directly proportional to length.

Three main forces control twist drills; (1) axial thrust for feeding, (2) radial force (or torque), which rotates the drill, and (3) side thrust. This side thrust (which the bushing is intended to control) is produced by improper drill grinding, rough surfaces, and excessive spindle runout; and it results in uneven cutting. But drills from 5/16 in. down have little, if any, side thrust.

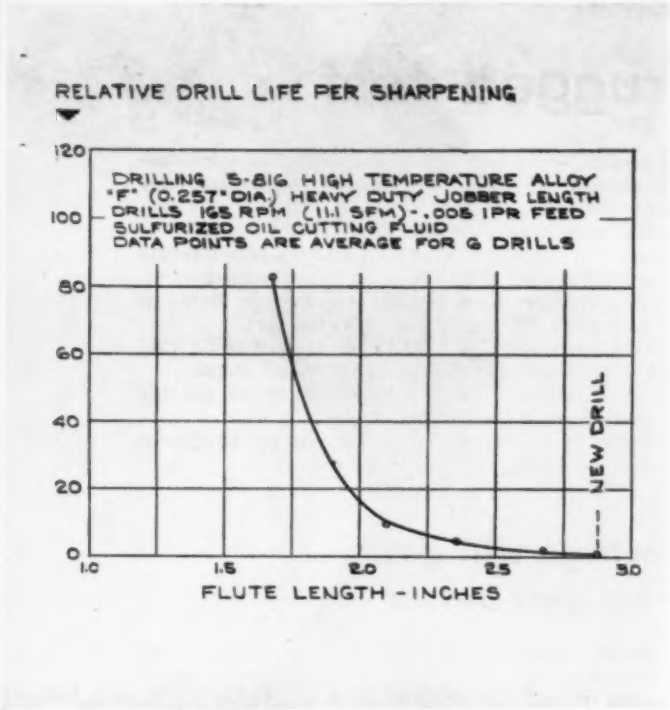
Side thrust is important only when the drill enters the hole, because the sides of the hole will act on the penetrated drill margins much like a bushing. If the ratio of drill projection to diameter is low, bushings are not required in many cases. A ratio of 2 in. of projection to a ½-in. dia is rigid.

Actually, most spindle-bearing wear—which many engineers worry about when bushings are eliminated—is caused by misalignment between the spindle and the bushing. When misalignment is more than 0.002 in., it causes wear in the bushing and in the spindle bearing; and it produces spindle deflection.

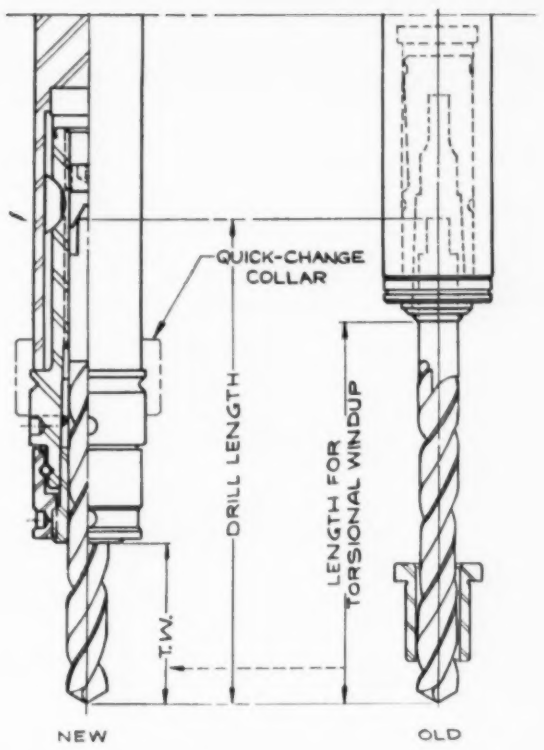
Why Misalignment Occurs

Misalignment of the drill with the bushing (see sketch) can be caused by lack of straightness or eccentricity in the tool, in the toolholder, in the spindle, and in the spindle bearings. Or misalignment can be caused by heat, mechanical spindle defects, wear, and so on.

It is the contention of Mr Conn that drill bushings can be eliminated on single-purpose machines in many cases, and that this would simplify drill removal.



Drill length . . .
has a sharp effect on cutting life, which increased 80 times in recent tests, when the drill was shortened from 2⅞ to 1-11/16 in.



Quick-change tool grip . . .
. . . reduces torsional windup (TW), and simplifies depth control

stub drills

Much high-production drilling does not require close hole spacing. For example:

- Holes to be tapped.
- Clearance holes for bolts.
- Oil holes.
- Holes to be reamed later.

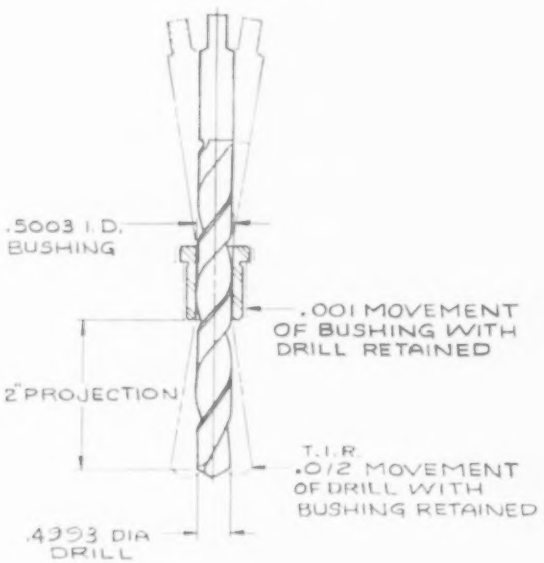
These can be drilled without bushings, using a quick-change toolholder that supports the drill close to its end (see sketch).

Standard drills in standard bushings run into a large number of possible problems—drill back taper, spindle runout, drill tolerance, short bearing area in the bushing, and weak side support from the bushing. A bushing is required when drilling hard materials.

But a stub-held drill needs no bushing plate, and tool changes can be made with a pre-set collar to reduce tool-change time 80%.

As drill projection is increased, regardless of the bushing, more deflection and twist will occur as the drill enters the hole, because a drill point tends to "stagger" around until it digs into the work.

With stub drills, heads must be made to tighter hole-center locations, depending less on bushing location for accuracy. In some cases the drills may require double margins. **Stub drills may not apply in all cases, but they are successful in automotive transfer machines, and some disadvantages may be compensated for by much shorter tool-change time and much longer life between grinds.**


.5003 I.D. BUSHING
.001 MOVEMENT OF BUSHING WITH DRILL RETAINED
2" PROJECTION
T.I.R. .012 MOVEMENT OF DRILL WITH BUSHING RETAINED
.4393 DIA DRILL

Standard drill in standard bushing . . .
. . . is subject to drill back taper, spindle runout, drill tolerance—and bushing support comes from only a small area

Ceramic tools pass rugged test

A thin shim of aluminum foil, 0.0015 in. thick, has solved one of the major problems in applying oxide tools to heavy roughing cuts at Watervliet Arsenal.

John Rodd and George Hutson, project engineers in the Operations Engineering Branch, found that placing the foil between the oxide tip and the carbide seat in the holder compensates for irregularities at the interface. The larger contact area that results seems to make the oxide more shock resistant.

And shock is a major consideration in rough turning the tubes for 120-mm tank guns. Because of eccentric distribution of the rough stock in the forgings, the depth of any cut may vary from ¼ to ⅝ in.

In addition, the modified 4330 steel (tensile: 180,000 psi) of these tubes is notoriously difficult to machine. It is hardened and drawn to 38 to 42 R_c with occasional hard spots of 45 to 48 R_c. This is a tough job for any cutting tool.

Longer Life for Ceramics

Average life for carbide tools during the rough-turning operation has been 130 linear in. at 0.022 ipr feed and 150 to 180 sfpm. Ceramic tools are running 300 linear in. with feed reduced to 0.017 to 0.020 ipr and speed increased to 380 sfpm. Stock removal is 1 cu in. per min with the carbide and 3 in. per min with the ceramic.

Another advantage was gained because cemented oxide tools characteristically transmit the cut-generated heat into the chip and not into the work.

Gun Barrel "Growth"

When the 24-ft-long gun barrels were machined with carbide, they heated enough to "grow" noticably —enough to require continual adjustments of centers and steady rests. With ceramic tools, the part stays cool despite the higher stock-removal rate, and no adjustments are required after the original setup.

All tests were conducted with standard heavy-duty mechanical toolholders. For production, however, the toolholder was modified to include carbide backup plates and serrated adjustable chip breakers.

The Watervliet engineers have found a definite advantage in negative tool geometry for ceramic tools when machining high-strength alloys. Positive geometry, they say, reduces tip cross-sectional area and leads to rapid tool failure.

The geometry that has yielded the most successful results is a –7° side and back rake, a –15° lead angle, a 0.062-in. nose radius, and a 0.005 to 0.010-in. land honed at a 30° angle on the cutting edge. However, when machining scale and out-of-round workpieces, the lead angle is advanced between 30° and 45°, and the speed is reduced to eliminate possible chatter caused by increased chip width.

Among important operating rules observed for machining high-strength materials with cemented oxides.

- Cutting edge must be placed on the centerline of the part.
- Cutting forces must be directed to the center of the tool shank.
- Chip breaker must curl the chip above the holder.
- Cutting tip must not be allowed to dwell in the cut.

Engineer shortage will get worse before it gets better

Even before Soviet Russia again jumped ahead of the United States in the race for space with its sun-circling Lunik, American industry began a new clamor for scientists and engineers. Slowed considerably by the recession, intense recruiting of scientific manpower has entered a new phase accelerated by three factors:

- Current business recovery.
- A substantial decline in college engineering enrollments.
- An apparent deterioration in professional credentials of college and university teachers in engineering and science courses.

Recession Effects Spotty

Those are facts brought out during the Conference on Scientific Manpower in Washington early this month. Conferees reported that the impact of the recession on engineer and scientist demand was spotty. Those laid off during the recent drastic defense cutbacks found more difficulty in getting new jobs than did 1958's engineering college graduates, who received an average of 3.4 job offers—a pretty choice figure, even though the 1957 graduate received an average of 6.8 job offers.

Engineer Demand Again High

But now, with the recession largely over in most industries, the engineer is again coming into his own. For instance:

- Listings of job openings for engineers, compiled by the U S Bureau of Employment Security, have more than doubled since January, although they are still running somewhat below 1956-57 levels.
- Help wanted display advertising for engineers and scientists has jumped back to 1956 levels, despite newspaper strikes.
- The 13th Annual Survey of College Recruiting Plans of 200 large and medium-sized corporations, conducted by Northwestern University, indicates that these firms plan to hire 13% more graduating seniors in engineering, physics and chemistry this year than they did from the Class of 1958.
- The latest salary survey conducted by the Engineers Joint Council shows that insofar as rising salaries reflect pressure on the demand side, engineers continued to gain despite the recession. The median salary of engineers rose 13% between the summer of 1956 and the summer of 1958, while average hourly earnings of factory workers rose only 10%.

Greatest cause for alarm, manpower specialists find, is this year's 10% drop in freshman engineering enrollment—at the same time that total college freshman enrollment jumped 7%. Since 1953, engineering freshman enrollment had accounted for 10-11% of all freshman enrollment. This year they account for less than 9%.

And that means U S engineering schools will produce only 37,000 graduates in 1962 (compared with 42,000 in 1960, and 42,500 in 1961) in the face of Russia's intensive engineer training program.

capsule descriptions of all new equipment covered in our pages in 1958 are presented in this 46th annual review. Each item carries the date of the original description. Here are the latest

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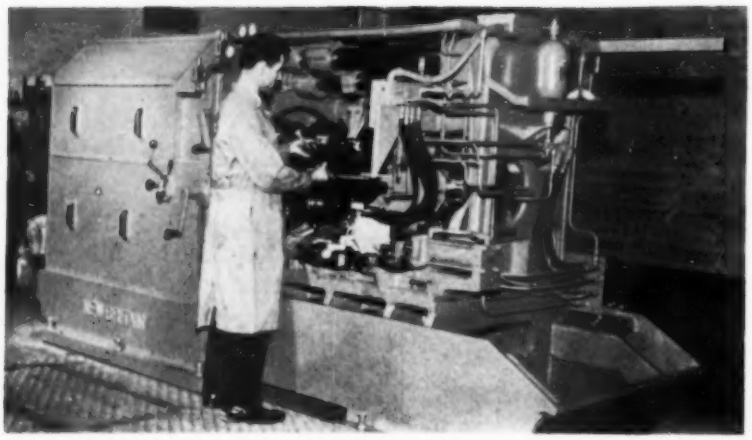
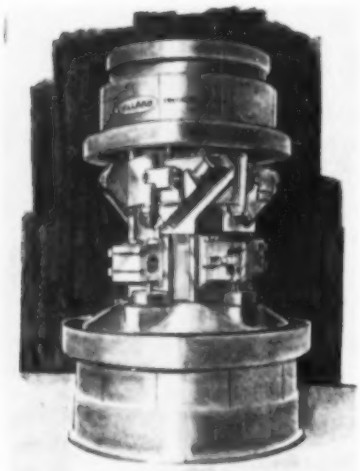
American Machinist 1959 PRODUCTION PREVIEW

TURNING



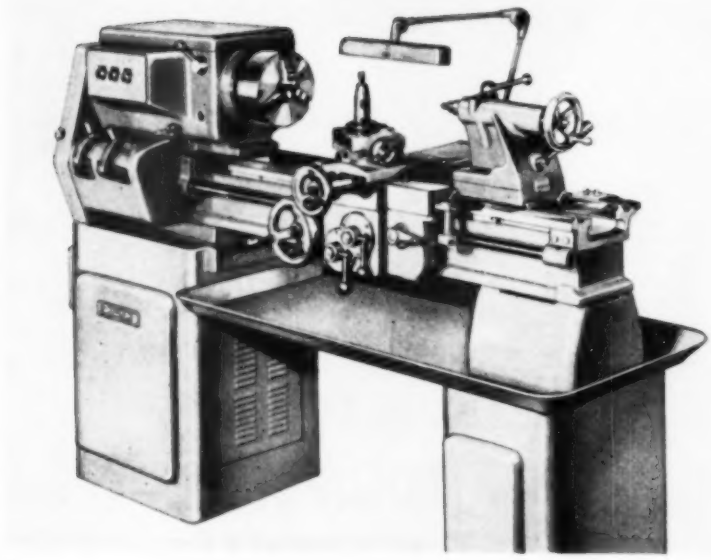
MULTI-SPINDLE COPYING LATHE —*New Britain Machine Co, New Britain, Conn.* Model 412/25 lathe turns transmission shafts in 32 sec. Bearing diameters are held to 0.0015 in., and these diameters are concentric within 0.002 in. Machine uses four indexable carbide toolbits. Hydraulic copying slides have double interlocks. Turning length can be suited to job. Machine is equipped with a chip conveyor (Jun 2, p117).

TRACER ATTACHMENT — *True-Trace Sales Corp, 9830 E Rush St, El Monte 50, Calif.* True-Trace single-dimension, 45° lathe tracer attachment permits relatively unskilled labor to perform such tracing applications as step shaft turning, contour turning, and facing operations involving both simple and complex contours. Flat or round templets can be used. Unit is adaptable to almost all makes of lathes (Jun 30, p112).



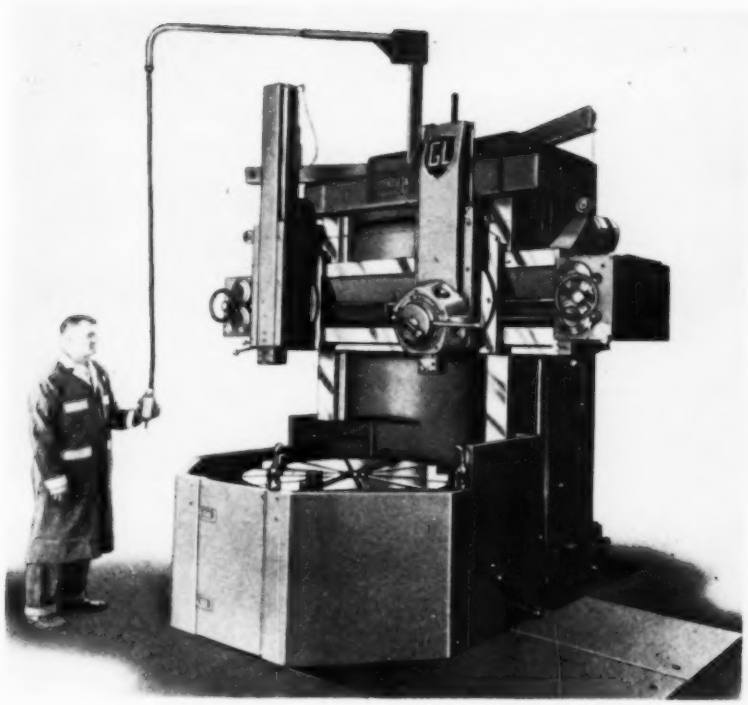
VERTICAL AUTOMATICS—*The Bullard Co, 286 Canfield Ave, Bridgeport 2, Conn.* Contour turning machine (illustrated), called Contin-U-Matic, is a 4-spindle machine with hydraulic feeds on all heads. Each permits choice of coarse or fine feed, with automatic feed and speed change. The Mult-Au-Matic 6-spindle machine gives selective speeds and feeds at each station. Speeds range from 56 to 100 rpm; there are 81 feed change possibilities (Apr 7, p129).

AUTOMATIC — *Hudson Automatic Machine & Tool Co, 137-138 38th St, Union City, NJ.* Strohm M45 has a capacity of 5/32 in. It has five tools and a turning length, with flat cam, of 2 in. Spindle speed is 14,000 rpm (Apr 21, p184).



LATHE — *Sheldon Machine Co, Inc, 4258 N Knox Ave, Chicago 41, Ill.* This 15-in. lathe combines the capacity and power of a geared head lathe with economy and flexibility of a belt-driven lathe. Lathe is available with 5-, 6- or 8-ft bed lengths, providing 31, 42 or 66 in. between centers. Swing over bed ways is 15¼ in; over cross-slide, 9½ in. The carriage is 17½ in. long; carriage bridge is 6 3/16 in. wide. Speeds range from 40 to 1250 rpm. Price is $2350 (Sep 22, p135).

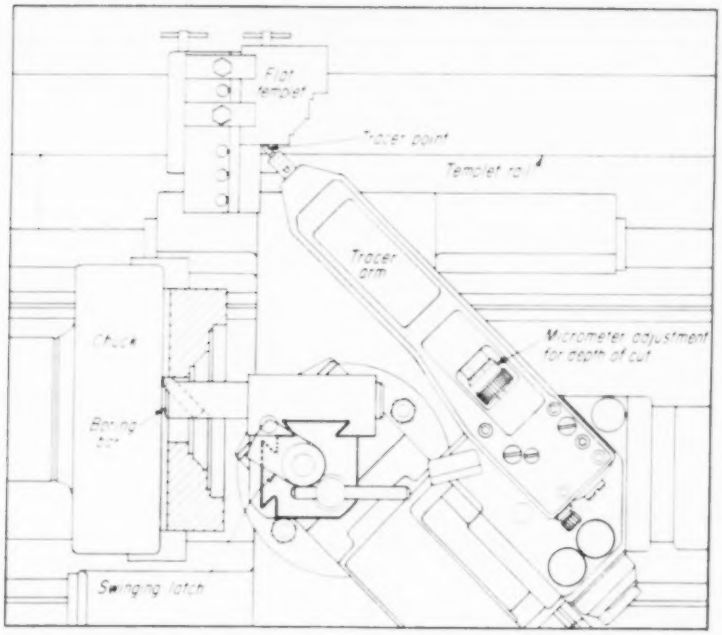
LATHES — *Distributed by Stanley Sheppard, 30 Church St, New York 7, NY.* British Harrison 13-in. geared head lathe features totally enclosed headstock, gear box and apron, all with oil bath lubrication. Clutch control provides nine spindle speeds from 55 to 1250 rpm; 18 spindle speed range from 38 to 1750 rpm is optional. Second lathe is a 16-in. hydraulic copying lathe which incorporates most of the features of the earlier Harrison 16-in. standard lathe (Apr 21, p187).



ELECTRIC VERTICAL TURRET LATHE—*Giddings & Lewis Machine Tool Co, Kaukauna Div, Kaukauna, Wis.* Largest of the three machines in the company's VTL line, this machine has a 52-in.-dia table. All 32 speeds in two ranges are obtained from a coaxial, planetary transmission. Standard machine has 32 table speeds, 5 to 67 rpm in low range and 20 to 272 rpm in high. Twenty-two independent feed rates are provided for each head, ranging from 0.0007 to 0.576 ipr (Dec 15, p130).

RADIUS TURNING MACHINE — *Louis Levin & Son, Inc, 3610 S Broadway, Los Angeles 7, Calif.* Machine can turn concave or convex radii up to 1 in. and is provided with a longitudinal slide in addition to slide used for turning. Tool can be fed into the work without altering the radius for which it is set. Standard Levin lathe headstock has collet capacity of either 3/16 or 5/16 in. (May 19, p164).

AUTOMATIC THREADING LATHE —*Man-Au-Cycle Corp of America, 132 54th St, Brooklyn 32, NY.* Hydro-Magnetic Model 13-36, with aid of new accessories designed integrally with the basic machine, is capable of tracing, turning, facing, cutting off, and automatic cycle threading with a single simplified chucking operation. Tracing is performed internally and externally from a master which can be a duplicate of the work (Jun 16, p134).



AUTOMATIC LATHE CONTROL—*De Silvey Corp, Pennsylvania Ave, East Aurora, NY.* Director control unit performs automatically all turret lathe functions previously done by hand. Any turret lathe equipped with the device can be operated fully automatically, semi-automatically, or completely manually. Operator can control all operations from a panel (Jun 2, p124).

LATHE CARRIAGE STOP — *G K Products, 9548 Gidley St, Rosemead 2, Calif.* Device provides positive cutting depth control for small and medium lathes in any of 6 pre-selected positions. Unit's six threaded stops provide more positive and accurate control over length of lathe travel. Model attaches to the bed of 90° V-way American or foreign lathes; an adapter is furnished on request for other types (Jun 16, p156).

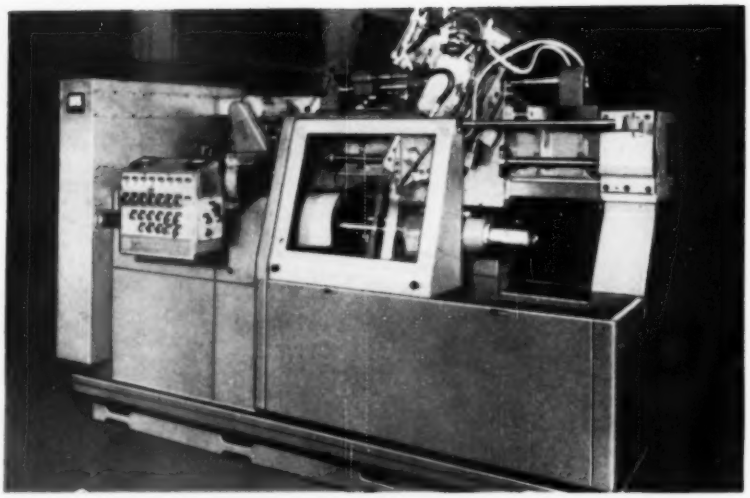
UNIVERSAL TURRET LATHE—*Imported by Sigma Machinery Inc, Two Park Ave, New York 16, NY.* Model R5 (Czechoslovakian) has 20-in. swing over bed, 10-hp drive, and 2-in. bar capacity. The pre-selective headstock provides 18 speeds between 35 and 1800 rpm. Chucks, collet pads, and turret tooling are interchangeable with American-made machines (Oct 6, p141).

TURNING MACHINE — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Aluminum hemispheres from 6 to 16 in. dia have ODs and IDs rough and finish machined on custom turning machine. Special work spindle permits unit to hog out material at rate of 15 cu in. per min. Tolerance of less than 0.0001 in. on hemisphere radii and approx 0.0001 in. total on wall thickness are maintained on finish cuts. Surface finish of 10 rms or better is obtained (Nov 17, p244).

TRACER ATTACHMENT — *Leland-Gifford Co, Worcester, Mass.* Self-contained hydraulic tracing attachment replaces the regular compound slide, can be used to turn stepped or contoured shafts and to face and bore castings with internal steps and contours. Accuracy of 0.001 in. is possible. Attachment can be used on all types of lathes. Three sizes are available, for lathes with swings from 14 to 16 in., 16 to 20 in., and 20 to 27½ in. (Oct 6, p125).

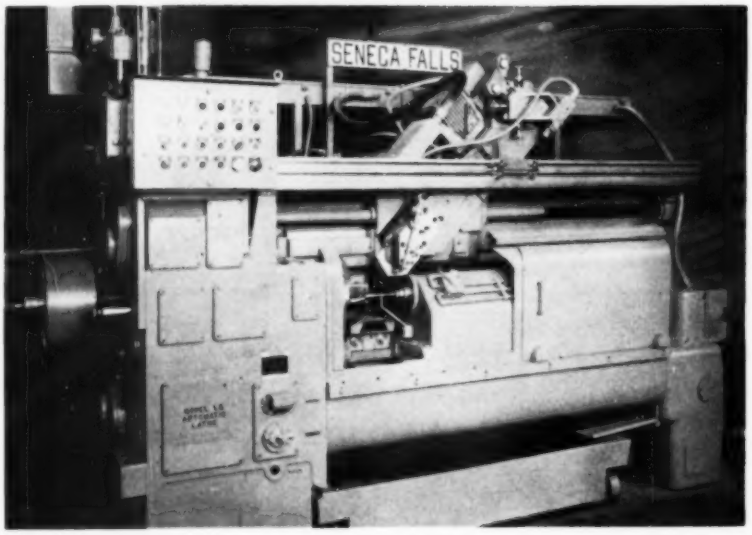
TAPER ATTACHMENT — *General Sales & Engineering Co, Dept AMN, 4525 N Clark St, Chicago 26, Ill.* Master Taper attachment equips any bench lathe to perform taper turning, boring and threading—internal or external. Installation requires the drilling of only two holes on carriage for fastening overarm. Tapers up to 4 in. per ft, or 20° in either direction are possible for a max of 12 in. longitudinally (Mar 10, p168).

AUTOMATIC TRACER LATHE — *Jones & Lamson Machine Co, Springfield 16, Vt.* Model 30 single-spindle automatic tracer lathe can accommodate either of two tracing units. Both units provide for feed change during cut. Two different headstocks are available; also a choice of rear slides for facing, forming and turning. Specifications include 23-in.-dia swing over rails; 13-½ in. over tracer slide; max workpiece dia, 8 in.; max length of work between centers, 24, 48 or 72 in. (Dec 29, p75).



LATHE ACCESSORIES — *Rockwell Mfg Co, Delta Power Tool Div, 481 N Lexington Ave, Pittsburgh 8, Penna.* Double toolpost cross-slide converts 11-in. engine lathe into a six-station turret lathe, or hand screw machine. Pilot wheel feed provides unusually rapid slide movement with a full 8-in. travel to increase range of jobs (Apr 24, p158).

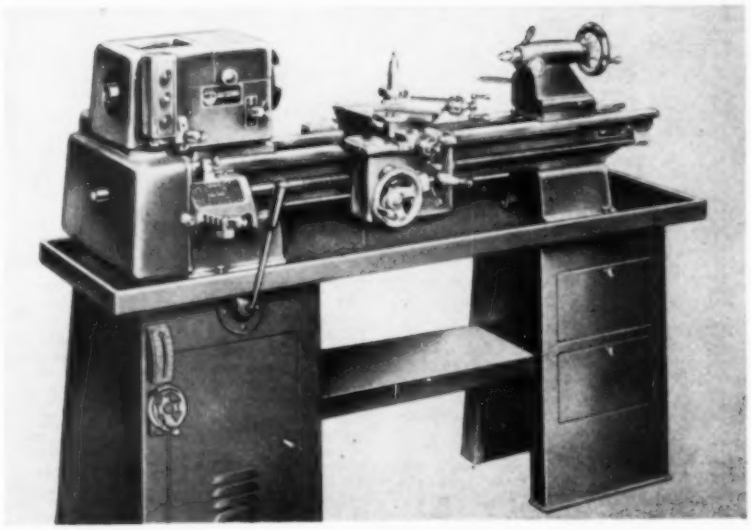
TURRET LATHE — *Challenge Machinery Co, Grand Haven, Mich.* Turret lathe features a special control which automatically returns the turret head to the starting position, thereby eliminating the need to index through all turret positions when only two or three operations are performed. This control also opens and closes the steadyrest (Oct 20, p202).



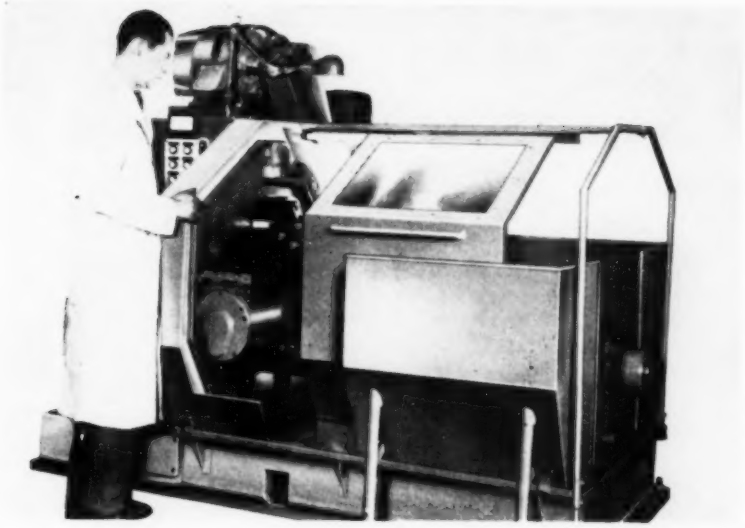
AUTOMATIC TRACER LATHES — *Seneca Falls Machine Co, Seneca Falls, NY.* Completely automatic tracer lathes, Models LQ and AQ, combine the advantages of multiple tooling for rapid stock removal and single tool tracer turning for accurate finishing operations. Specifications for Model LQ lathes include 20-in. swing over bed; capacity between centers of 26, 38, 50, 74, 98, and 110 in. Model AQ lathes have 22-in. swing over bed; capacity between centers of 26, 54, 68, 82 and 110 in. (Feb 24, p148).

RADIUS ATTACHMENT—*F W Derbyshire, Inc, Waltham 54, Mass.* Radius turning attachment for the Derbyshire Model A lathe can turn concave and convex radii. An indicator is available, in either 0.001 or 0.0001-in. graduations (or in millimeters), to provide operator with fine adjustments (Jun 16, p146).

COMPOUND SLIDE REST — *Louis Levin & Son, Inc, 3610 S Broadway, Los Angeles 7, Calif.* Compound slide rest is designed for standard jeweler's instrument lathes. Swivel slide is locked with two T-bolts and will hold securely under any strain. Both slides are fitted with micrometer stops. Unit may be supplied with screw feeds for both slides or with lever feeds on either or both (Mar 24, p158).

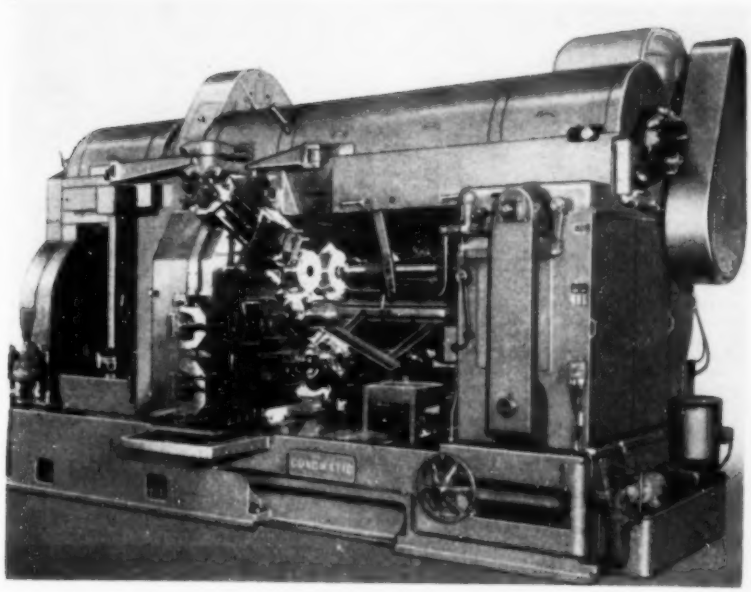


GENERAL-PURPOSE LATHE — *Atlas Press Co, Clausing Div, 26101 N Pitcher St, Kalamazoo, Mich.* The 5400-series, 12¾-in. lathe has an adjustable speed countershaft that makes instantly available any speed from 35 to 270 rpm and 210 to 1600 rpm while lathe is running. Series is also available with ball bearing countershaft. Quick-change mechanism provides instant selection of 54 threads or feeds. Additional specifications: 7⅝-in. swing over cross-slide; 23, 35, and 48½-in. centers (Feb 10, p154).



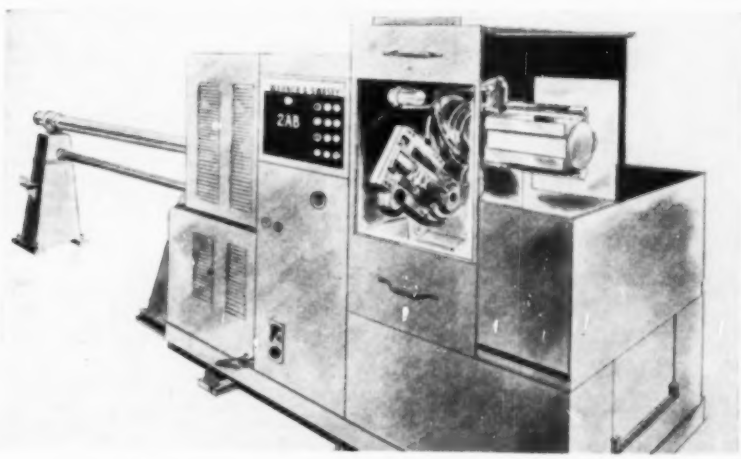
AUTOMATIC TURRET LATHE — *Potter & Johnston Co, Subsidiary of Pratt & Whitney Co, Pawtucket, RI.* Model 3E-15 is designed for high-speed production of hard-to-machine tough alloy components. It has a 10-in. chuck capacity and 11½-in. swing over base ways. Equipped with a 15-hp headstock, machine features all-electric speed clutches and precision ground speed gears. The independent front and rear cross-slides are individually adjustable along base ways (May 19, p150).

CONTOURING LATHE—*Monarch Machine Tool Co, Sidney, Ohio.* Designed for precision contour turning, boring and facing of missile nose cones, nozzles, motor cases, airframe sections, domes, and other large, thin-walled and fabricated parts, the Missile Master has a clearance diameter of 85 in., with 67-in. cross-slide swing. Bed lengths are available with up to 300 in. between centers, in increments of 48 in. The lathe is equipped with swiveling air gage tracer contouring system (Jul 28, p101).



TOOLROOM LATHE — *Distributed by Eric R Bachman Co, Inc, 27-11 41st Ave, Long Island City 1, NY.* German-made Weiler Model LZ330p toolroom lathe features 13-in. swing, 31½-in. center distance and collet capacity of 1 in. Machine is equipped with spindle nose and collet adapter for 5C Hardinge collets. Spindle speeds are adjustable from 22 to 2800 rpm. Lathe can be equipped with a hydraulic copying attachment (Apr 21, p189).

SIX-SPINDLE CONOMATIC — *Cone Automatic Machine Co, Inc, Windsor, Vt.* Model TN is a 6-in. six-spindle machine designed to handle a wide range of screw machine work. The maximum load of stock—six 6-in.-dia bars twelve feet long—would weigh 6921 lb. The 2nd and 3rd cross-slide positions are in a single slide. The 4th, 5th, 6th and 1st are in independent slides. All slides move horizontally except the 5th slide which is tilted 30° from the horizontal (Dec 1, p137).

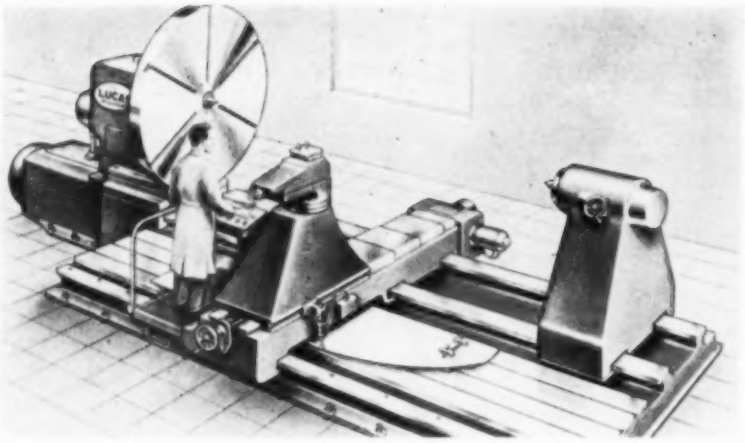


GENERAL PURPOSE LATHES — *Atlas Press Co, 2210l N Pitcher St, Kalamazoo, Mich.* Back-geared pedestal-base lathes come in two sizes: No. 3990 (illustrated) has 12-in. swing, 24-in. centers, 42-in. bed, and quick change gears. No. 3991 has 12-in. swing, 36-in. centers, 54-in. bed, and quick-change gears. Both provide 54 thread selections, from 0.0042 to 0.250 in. The bench lathes are available with quick-change or standard change gears (Apr 7, p136).

BAR AUTOMATIC—*Warner & Swasey Co, 5701 Carnegie Ave, Cleveland 3, Ohio.* 2AB single-spindle bar automatic has an automatic hydraulically-operated collet chuck and bar feed of 3-in.-dia capacity. Bar feed stoke is infinitely adjustable from ⅛ to 10 in. A manual high-low selector and six-speed transmission provide two ranges of six speeds; from 120 to 1544 rpm in high, and 56 to 728 rpm in low. A total of six automatic feed changes from a selection of 36 feeds are available during machining cycle (Jan 13, p156).

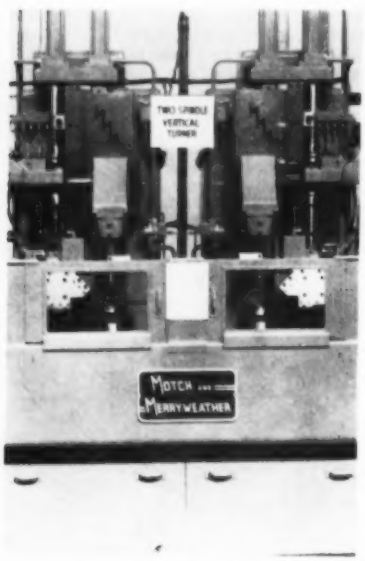
TURNING

LARGE-SWING LATHE—*Lucas Machine Division, New Britain Machine Co, 12302 Kirby Ave, Cleveland 8, Ohio.* Designed for turning operations on cylindrical, conical, or developed shapes on lightweight pieces of great length and diameter, machine is available in semi-automatic and tape-controlled fully automatic models. Models are available with up to 96-in. swing over bedways and up to 192-in. length (Jul 28, p103).



LATHE — *Baldwin-Lima-Hamilton Corp, Hamilton Div, Hamilton, Ohio.* High-production lathe is designed for turning and burnishing railway car wheel sets and axles. It is a double-carriage, single-end drive type which can be supplied as a straight axle lathe that also can provide contour profiling, or as a journal lathe that also can be used as an axle lathe. Bed length is 18 ft.; center height from floor line is 46 in.; bed width across bedways is 40 in. Swing over bed is 45 in. (Sep 22, p146).

LARGE-SWING LATHE—*R K LeBlond Machine Tool Co, Cincinnati 8, Ohio.* Two large-swing, relatively light-horsepower lathes, the General One-75 (illustrated) and the Admiral Two-120, are designed to meet industry's demand for reasonably priced lathes of unusually large swing to turn missile bodies and other large cylindrical, tubular and fabricated parts. Both lathes are available with up to 50 hp, and both feature new wide-bed design (May 19, p148).



VERTICAL TURNER—*Motch & Merryweather Machine Co, 1250 E 222 St, Cleveland 17, Ohio.* These machines, available in either two- or four-spindle models, are designed for either high or low production work and quick-changeover jobs. Each half of machine may be run independently of other half. Specifications include spindle speeds of 20 to 5000 rpm; max stroke of horizontal slide, 6 in.; max stroke of vertical slide, 12 in.; max swing, 20 in. dia. Working height is 47 in. (Aug 11, p119).

4-SPINDLE VERTICAL LATHE — *Baird Machine Co, Stratford, Conn.* This 8-in., 4-spindle machine may be tooled for economical production of many jobs normally calling for costly special-purpose equipment. All four spindles perform the same operations and are continuously in operation. Each spindle has precision automatic workholding, with two vertical and one cross-slide tool motions in any required combination (Apr 21, p206).

LATHE — *Axelson Mfg Co, PO Box 58335, Vernon Station, Los Angeles 58, Calif.* Model 6049F, designed for turning large diameters and odd-shaped workpieces, swings 60 in. over ways and 49 in. over cross-slide. Headstock is driven by 40-hp motor and has 24 spindle speeds from 6 to 750 rpm, with 3 to 375 rpm alternate, forward or reverse. Gearbox provides 81 feeds and 45 leads (Jan 13, p160).

AUTOMATED TURRET LATHE — *Logan Engineering Co, 4901 W Lawrence Ave, Chicago, Ill.* Automated turret lathe, first of a series designed for efficient short or long production runs, has 14-in. swing and a 1⅝-in. spindle hole. It is powered by a two-speed reversing motor with variable speed drive. Rapid-travel feed cycle variations are selected through set-up switches (Apr 21, p196).

SPEED LATHE — *Schauer Mfg Corp, 4500 Alpine Ave, Cincinnati 42, Ohio.* Unit is designed for polishing, deburring or similar secondary finishing work on metal and plastic parts. Type LA1c permits loading and unloading of collet without stopping the spindle. For gaging or inspection, the spindle can be stopped without disturbing the position of the workpiece (Apr 21, p186).

TWO-POSITION TURRET — *Monarch Machine Tool Co, Sidney, Ohio.* Designed to accommodate two 1 x 1½-in. tools this hydraulically-actuated turret indexes 180° in either direction. Operation is entirely automatic; control being supplied by the multi-cycle programmer mechanism of the Model 21 Mona-Matic lathe, for which the turret is specifically designed. Programming can be adapted to meet any machining requirement (Apr 7, p134).

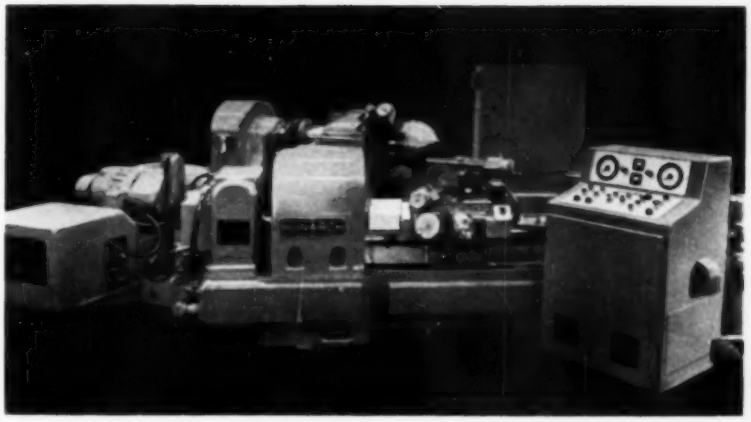
LATHE—*Imported by Cosa Corp, 405 Lexington Ave, New York 17, NY.* German-made Eltromatic lathe automatically provides constant cutting speed because spindle revolutions are automatically controlled by tool travel. Cutting speed is constant even on copy-profiling jobs with varying contours. Machine provides eight speed groups with cutting speeds ranging from 20 to 1809 fpm (May 19, p162).

SECOND-OPERATION LATHE — *Sheldon Machine Co, Inc, 4258 N Knox Ave, Chicago, Ill.* Model ZMW-46P features a pushbutton variable-speed drive with spindle speeds from 40 to 2000 rpm. Actual speeds are read on build-in tachometer. Other features include 13-in. swing over bed, 6¼-in. swing over cross-slide, 6½-in. stroke of turret, and 1 1/16-in. spindle collet capacity (Apr 21, p195).

TURNING HEADS — *DeVlieg Microbore, Div of DeVlieg Machine Co, 2720 W Fourteen Mile Rd, Royal Oak, Mich.* New turning heads are equipped with micrometer vernier toolpoint adjustment and are designed to perform a variety of turning operations from the turret of all types of horizontal turret lathes. The accurate adjustment and rigidity of heads permit heavy stock removal while holding close tolerances (Apr 21, p188).

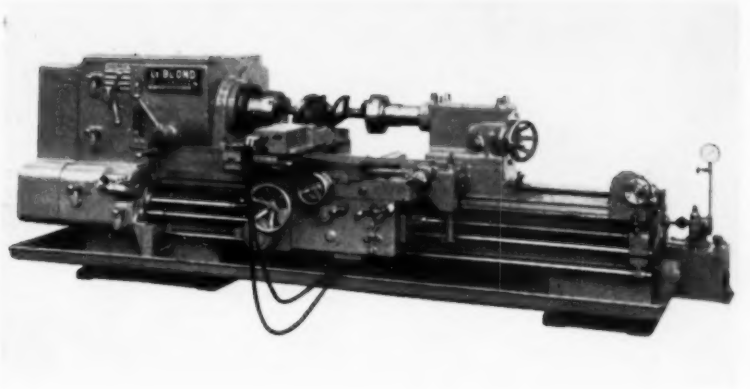
SINGLE-SPINDLE CHUCKER — *Guthery Machine Tool Corp, 38-31 Crescent St, Long Island City, NY.* Traub Model AF 130 incorporates an air chuck with over 5-in. capacity. Its rigid cross-slides can be moved longitudinally, independently. Max turning length is 5½ in. Unit is recommended for secondary operations such as turning, facing, boring, or forming of all types of metal parts (Jun 16, p136).

LATHE STOP — *DSC Machine Co, 21 Bertel Ave, Mount Vernon, NY.* Designed to enable a semi-skilled machinist to hold tolerances closer than ± 0.001 in. on ordinary engine lathes, the Sure Stop maintains close tolerances in the duplication of machine parts. Device has five easily adjustable stop rods which index accurately to allow a wide range of machining possibilities (Apr 7, p137).



CHUCKING CONTOUR LATHE — *Monarch Machine Tool Co, Sidney, Ohio.* Series 180 lathe is designed for ultra-precision contour tracing. Completely new, this chucking lathe is intended for ID and OD machining of thin-wall spherical and related shape workpieces from 5 to 15 in. in diameter. The spindle is set at a 30° horizontal angle to the bed axis. Speed range is from 8.5 to 1000 rpm (Dec 15, p136).

HIGH-SPEED GAP LATHE — *Graham Machine Tool Co, 9 Cleveland Pl, New York 12, NY.* Barrett 18 x 20 features spindle speed preselector, allowing operator to select and engage speeds while spindle is running. The 18 spindle speeds range up to 1800 rpm. Other features include tapered roller bearings; gib adjustment; forced lubrication for carriage; and hardened and ground beds (Apr 21, p194).



LATHE BED TURRET — *Precision Processing Co, 3269 Casitas Ave, Los Angeles 39, Calif.* The A K extra-heavy-duty bed turret is available in two models; one with straight ram, one with tilt head ram. Turrets are designed for most lathes in the 13- to 16-in. range. Self-indexing, 6-station turret converts engine lathe into ram-type turret lathe. All tool holes are blank (Dec 29, p75).

CONTOUR CHASING LATHE — *R K LeBlond Machine Tool Co, Cincinnati 8, Ohio.* Specially designed 32-in. standard duty engine lathe automatically machines any concave or convex contour on spiral-shaped parts. Instead of continuously tracing, a tracing unit is used to position the tool for each successive cut. Tool cutting motion is accomplished by "chasing" the spiral, the same as chasing threads. Feeds are from 0 to 0.070 in. (Feb 10, p151).

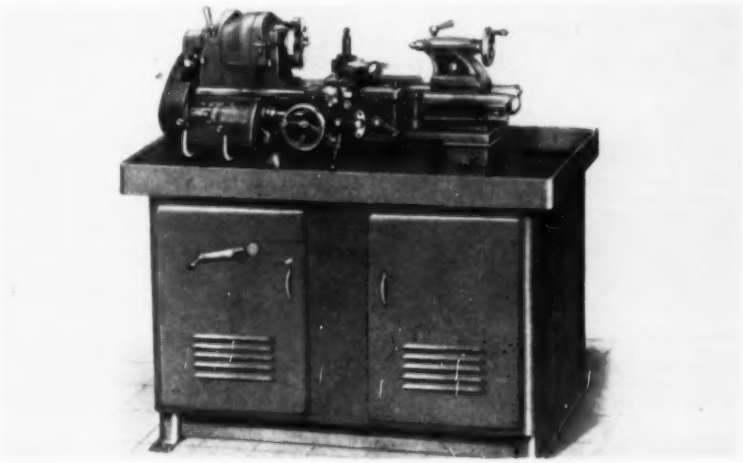
CENTERLESS TURNING MACHINE —*Taber Instrument Corp, 111 Goundry St, North Tonawanda, NY.* Karge Turnomat automatic centerless turning machine, Model 901-1750, produces intricate shapes, contours and tapers in one pass with a single point tool. The traveling Turnomat spindle collet and single point tool move along the bar as a unit. The machine handles bars from $\frac{3}{8}$ to $1\frac{3}{4}$ in. in diameter (Jul 14, p126).

DUPLICATING ATTACHMENT—*G K Products, 9548 Gidley St, Rosemead 1, Calif.* Profil-Matic hydraulic duplicating attachment is installed in place of the regular compound and functions through a stylus sensing the convolutions of a master templet. Device can be installed either parallel to the lathe bed or in line with the cross-slide, allowing the machine to turn, bore and face to its maximum capacity (Nov 3, p140).

HYDRAULIC COPYING ATTACHMENT—*Guthery Machine Tool Corp, 38-31 Crescent St, Long Island City, NY.* Attachment for Traub Automatics is available with a 3-in. turning length for Models A-15/25 and with a 4-in. turning length for Model A-42. Additional accessories include a two-spindle drilling and threading attachment; opposed spindle unit; and back boring attachment (Oct 20, p124).

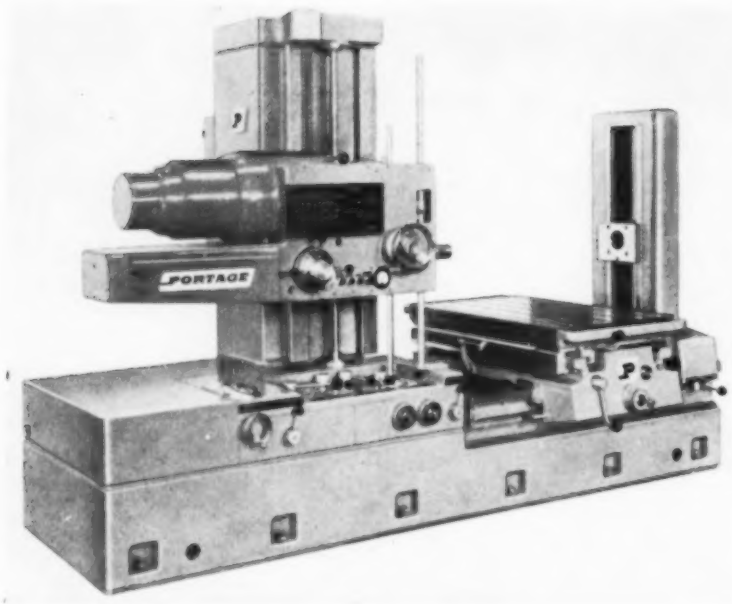
AUTOMATIC TURRET LATHE — *Gisholt Machine Co, Madison 10, Wis.* With the application of the Lynn Hydraulic Drive (Lynn Mfg Co, Minneapolis, Minn) to the turret carriage and the Hydro-Slide to the cross-slide carriage, the Gisholt Masterline ram-type turret lathe becomes completely automatic in all its functions. The Recipromatic, an optional accessory, is designed to clear accumulated chips when drilling deep holes (Feb 24, p149).

LATHES—*South Bend Lathe Works, South Bend 22, Ind.* Line of 10-in.-swing lathes incorporates many new design features in the gear box, carriage, bed and tailstock. Both bench and floor models are supplied with either engine lathe or toolroom lathe equipment. Capacity through spindle is $1\frac{3}{8}$ in. with 1 1/16-in.-max collet capacity. When equipped with a two-speed motor, the lathe has 24 spindle speeds ranging from 27 to 1400 rpm (Jul 28, p104).



American Machinist 1959 PRODUCTION PREVIEW

BORING



JIG BORER — *Suburban Machine Co, 5963 Harrison Ave, Cincinnati 11, Ohio.* Angle Master VAH 25 can handle many of the complex operations that arise in tool, die, mold and fixture work with minimum setup time. Machine has 16 x 48-in. table with longitudinal travel of 32 in. and cross travel of 12 in. Sixteen spindle speeds range from 50 to 2500 rpm; spindle speeds are 0.0015, 0.003 and 0.006 ipr. Table feeds range from ½ to 15 ipm (Apr 21, p181).

BORING UNIT — *Greenlee Bros & Co, Rockford, Ill.* Hydro-Borer, Model S-7, for boring large assemblies or small individual pieces is 34½ in. long, 7¾ in. high, 5½ in. wide. Spindle diameter is 1¾ in. with No. 3 Morse taper. Length of stroke is 6 in. Feed is 0.0035 ipr reducible to 0.002 ipr; rpm ranges are 465, 900, and 1400. Unit is designed for mounting on workholding fixtures or large assembly jigs (Feb 24, p154).

BORING HEAD — *Pope Machinery Corp, Haverhill, Mass.* Six-spindle precision boring head is reported to provide hole-to-hole tolerance of 0.0002 in. The heavy-duty spindles are capable of boring holes round within millionths of an inch and are designed to produce fine surface finishes in the lower microinch range (Sep 22, p135).

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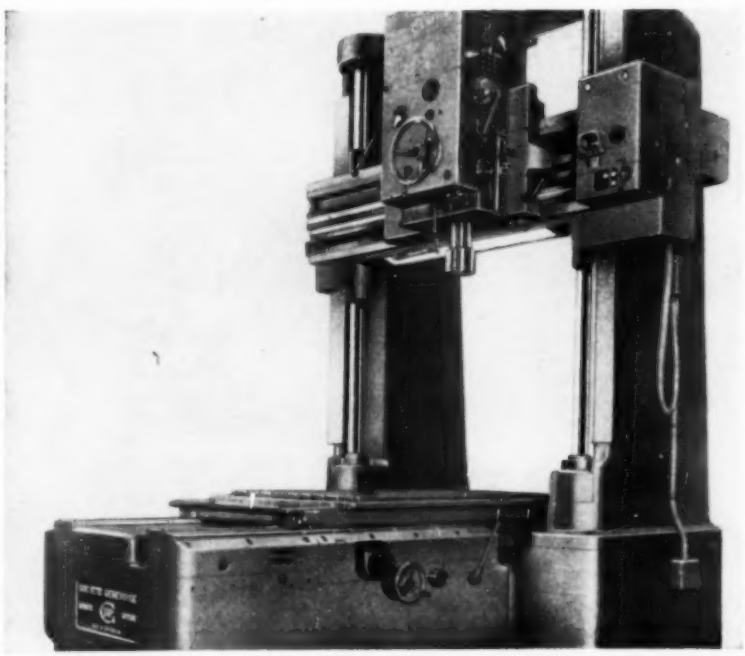
HORIZONTAL BORING MACHINE— *Portage Machine Co, 1025 Sweitzer Ave, Akron 11, Ohio.* Portage Model 3 provides infinitely adjustable feeds for all motions of the head, table, saddle and spindle. The full saddle feed range is from 0.03 to 30.0 ipm; head and table feeds range from 0.30 to 30.0 ipm. Rapid traverse for all motions is 90 ipm. Head is equipped with a 3-in. spindle. The 7½-hp 1750-rpm spindle motor provides twelve spindle speeds from 26 to 1535 rpm (Apr 21, p206).

TUBE BORING MACHINE — *Davis and Thompson Co, 4460 N 124 St, Milwaukee 18, Wis.* Two-station unit has a capacity of 4¼ through 9 in. dia, 18 through 48 in. length. Change gears provide adjustable spindle speeds of 68 through 510 rpm. Table feed is adjustable from 0 through 10 ipm, with a rapid advance of 250 fpm. Clamping is automatic. At end of automatic cycle, spindles are positioned to permit withdrawal of tools from workpiece (Nov 3, p133).



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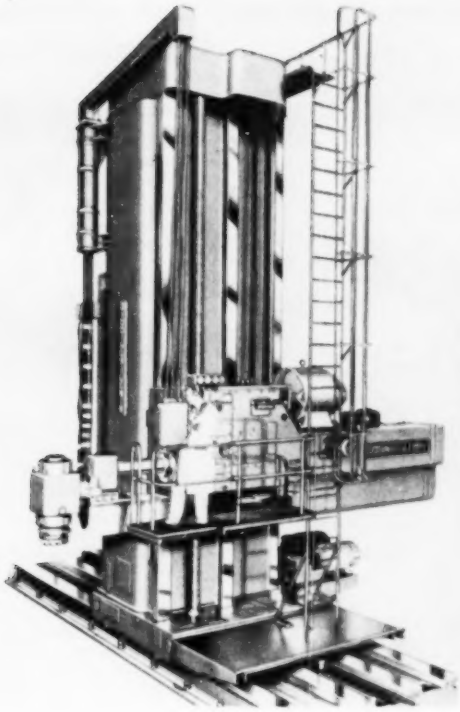
JIG BORER — *American Sip Corp, 100 E 42 St, New York 17, NY.* Hydroptic High 7A vertical spindle boring and milling machine can work to center of parts 70 in. in dia. Capacity under spindle is 71 in. Worktable measures 61⅜ x 40½ in. Displacement accuracy for all settings of table and saddle is within 0.002 in. (Apr 21, p180).



OPTICAL JIG BORER — *Manex Machinery Corp, 204 Central Park South, New York 10, NY.* Manex optical jig borer (Italian) provides optical sales that give longitudinal, crosswise and vertical settings to ten-thousandths of an inch. Spindle speeds are infinitely adjustable from 85 to 3000 rpm. Specifications include a 12 x 24-in. work table with a longitudinal travel of 18 in. and a cross travel of 12 in.; three automatic power feeds, 0.0015, 0.003 and 0.006 ipr (Apr 21, p250).

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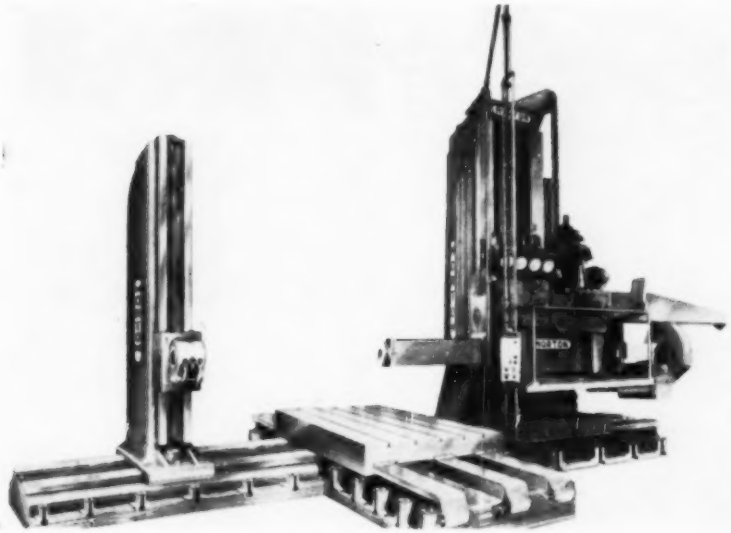
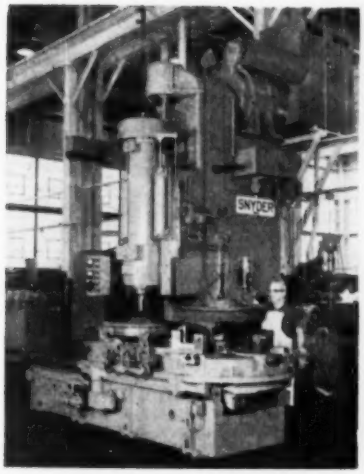
BORING MILLS — *Giddings & Lewis Machine Tool Co, Fond du Lac, Wis.* The 80 Series horizontal boring, drilling and milling machines have either an 8-in. or 10-in. dia spindle and feature vertical headstock travel in excess of 20 feet. This line has been arranged for adaptation of programmed controls including templet tracer, numerical positioning, and numerical contouring. Under numerical operation the machine will be controlled from either magnetic or punched paper tape (Nov 17, p237).





VERTICAL BORING MACHINE — *Snyder Tool & Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Machine uses low-production automation techniques to produce parts weighing as much as 700 lb. The spindle is powered by a variable speed drive and accommodates a variety of bore sizes. Equipped with a 7-ft-long spindle, machine produces heavy parts having long, large-dia bores (May 5, p151).

BORING UNIT—*Greenlee Bros & Co, Rockford, Ill.* Model S-7 Hydro-Borer packaged boring unit is completely flexible and adaptable. This 1¾-in.-spindle unit, designed specifically for mounting on jigs, fixtures and multi-station machines, is said to be extremely valuable for precision boring of large assemblies (May 5, p156).

BORING MACHINE — *Greenlee Bros & Co, Rockford, Ill.* Aluminum die castings are machined on this 3-station boring machine consisting of three Model S-6 Hydro-Borers mounted on a welded steel base. The RH and LH units are equipped with combination boring heads which face, counterbore and bore two aligned side holes. Rear unit bores an internal hole. Production is 120 pieces per hr (Feb 10, p156).

BORING SPINDLES—*Standard Electrical Tool Co, 2480 W Sixth St, Cincinnati 4, Ohio.* Super precision line is for operations using conventional boring tools, diamond boring tools, and similar tools. Illustrated are No. 4308B blocktype base; No. 4203B flanged base; and No. 4407B piggy-back assembly. These spindles, or the piggy-back assembly, are available in a standard design or custom-built (Nov 17, p250).

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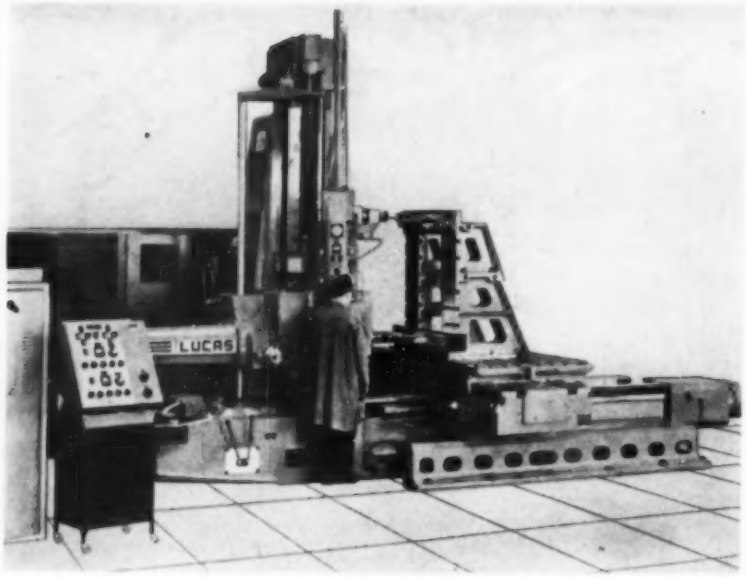
BORING AND MILLING MACHINES — *Morton Mfg Co, Broadway and Hoyt, Muskegon Heights, Mich.* Included in the line are the Model B and Model BC floor-type machines. Model BC features column cross travel. Likewise, the Model P and Model PC planer-type (illustrated) machines are being offered with the Model PC featuring column cross travel. These models are available in a square ram size range of 9 to 14 in. with an enclosed spindle size range of 6 to 10 in. A smaller series is also available (Jan 13, p159).



VERTICAL BORING MACHINE—*Morton Mfg Co, Muskegon Heights, Mich.* Large steam turbine sections are machined on this vertical boring and turning machine. Max boring capacity is 60 in. dia by 96 in. deep; max turning capacity is 84 in. dia by 48 in. long. Machine, in which the work remains stationary, is equipped with closed circuit TV with the camera rotating on the spindle with the tool head. Electronic numerical control system prepositions tools vertically and radially (Sep 22, p150).

BORING MILL — *Kaydon Engineering Corp, Frauenthal Div, Muskegon, Mich.* Vertical turning, boring and facing machine was designed for machining large propellers, but can be used for a wide variety of large-diameter work. Machine features swing capacity of 72 in. and pushbutton control of all major functions. Infinitely adjustable feed rates range from 0.002 to 0.030 ipr (Apr 7, p138).

JIG BORER—*Distributed by S & S Machinery Co, 140 53rd St, Brooklyn 32, NY.* Perrin-Swiss jig borer is equipped with a coordinate table incorporating a built-in optical system. Table measures 11 x 20 in. with longitudinal traverse of 16 in. There is 11-in. distance between spindle and column, 18½ in. between spindle and table. Infinitely variable range of spindle speeds from 50 to 3200 rpm is provided by a 2-hp motor (Jun 30, p116).

CONVERTIBLE JIG BORER—*Imported by Cosa Corp, 405 Lexington Ave, New York 17, NY.* The Deckel (German) LK machine tools feature interchangeable jig boring, jig grinding and optical projection measuring heads on one base. Changing heads takes only minutes. Machines can be used as three single-purpose units; or one base may be used with three heads. Direct numerical readings of settings eliminate reading errors (Nov 3, p134).

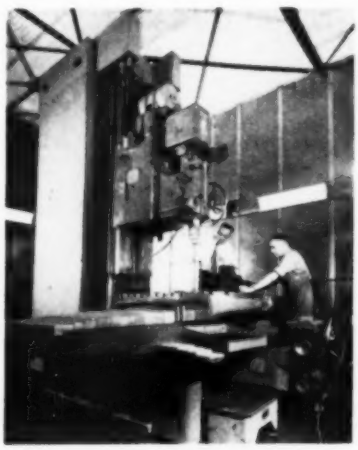
BORING MACHINE—*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Designed for single-pass boring of close center-distance holes, the Style 711 and 712 boring machines can be fitted with Ex-Cell-O spindles and custom-made multi-boring plates to bore such holes with all the accuracy associated with conventional boring methods. Features include pneumatically operated table with hydraulic feed control (Jul 28, p101).

VERTICAL BORING MILL — *Distributed by Barer Engineering & Machinery Co, Ltd, PO Box 1180, Montreal, Canada.* German-made Jungenthal is made in three sizes. Model DKE 800 has 35½-in. table, max turning dia 40 in.; DKE 1200, 43-in. table, capacity of 48 in. with side head, 51 in. above side head; and DKE 1600, 55-in.-dia table, turning capacity of 63 in. with side head, 67 in. above side head. Sixteen spindle speeds and sixteen feeds in various ranges are available. Automatic programming available (Mar 24, p164).

BORING MACHINE—*Lucas Machine Div, New Britain Machine Co, 12302 Kirby Ave, Cleveland 8, Ohio.* Complete line of table-type and floor-type horizontal boring, drilling and milling machines is available with GE program controls. Machines can be furnished with tracer equipment, numerical positioning equipment (punched tape) or numerical contouring equipment (magnetic tape). Machines can also operate as standard machines (Jun 30, p108).

BORING-THREADING MACHINE — *Distributed by Technical Development Co, 307 S Chester Pike, Glenolden, Penna.* German-made machine, designed for production machining of small and medium-size double-ended parts, provides for drilling, turning, fly cutting, facing, threading and tapping, and similar operations, simultaneously on both ends of the work (Aug 11, p130).

JIG BORER — *Pratt & Whitney Co, Inc, West Hartford 1, Conn.* Specially designed for nuclear reactor machining, unit incorporates a built-in gaging device and is capable of drilling, boring, and milling to an accuracy of 0.0001 in. Basic machine is standard P&W 4E Electrolimit jig borer. The rotary table, however, is provided with milling feeds, and the machine columns are 15 in. higher than the maximum usually supplied (Mar 10, p164).



JIG BORER—*Pratt & Whitney Co, Inc, West Hartford 1, Conn.* The 4EA jig borer is designed for machining or inspecting large components with extreme precision. Machine can locate to 0.0001 in. and can accommodate workpieces as high as 70 in. It can bore to the center of a workpiece 80 in. in diameter. Models are available with or without numerical control (Jun 16, p127).

OPTICAL JIG BORER — *Imported by Kurt Orban Co, Inc, 3¼ Exchange Pl, Jersey City 2, NJ.* Model LB-12 Lindner (German) optical jig borer has a 12 x 20-in. table, and is reported to be the only jig borer of its size not depending on leadscrews, gage blocks, measuring rods, electrical limit systems or limit switches. Measuring system reads to 0.00005 in; table settings are accurate within 0.00012 in. (Apr 21, p194).

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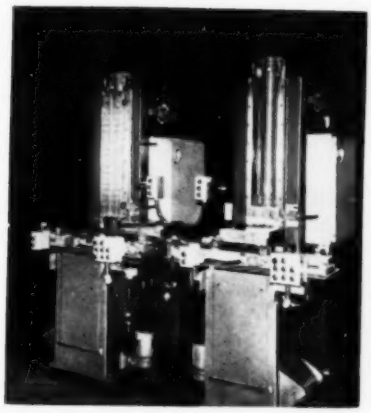
BROACHING



BENCH-MOUNTED BROACH — *Ty Miles, Inc, Box 446, Elmhurst, Ill.* Machine is designed for surface broaching of small parts. It accommodates interchangeable broaches up to 2½ in. wide, and can also be used for internal broaching. Accuracy to 0.0002 in. and surface finishes to 10 mu-in. are possible. Machines are made in various capacities, ranging from 2000 to 6000 lb. Ram stroke is from 6 to 24 in.; ram speeds from 20 to 60 fpm (Jun 2, p130).

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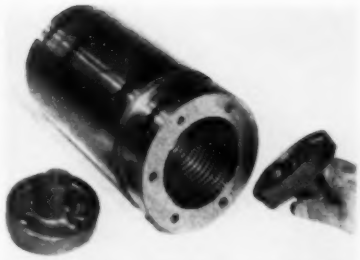
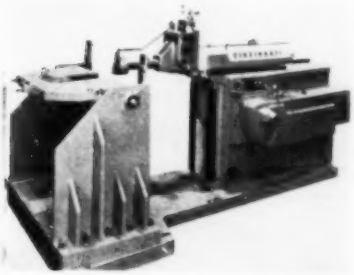
BROACHING MACHINES — *Colonial Broach and Machine Co, PO Box 37, Harper Station, Detroit 13, Mich.* Two standard Ram-Press broaching machines are mounted side-by-side to form a unit that permits one operator to run both machines. Mutual fixturing and controls provide maximum efficiency with a semi-automatic cycle. Operator loads one machine while the other is broaching. Both machines broach at 60 sfpm and use a broach-return speed of 120 fpm (Apr 21, p210).



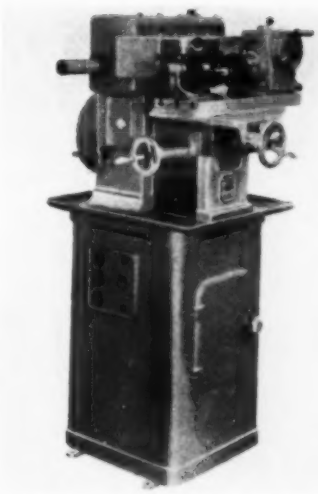
GEAR BROACHING—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Red Ring process produces external helical gears. HSS hollow broach, in which thousands of broach teeth are ground from the solid, is passed down over a rotating gear blank. High speed broaching process can be applied on conventional hydraulic presses, and is reported to produce extremely accurate gears (Aug 11, p122).

PLANING AND SHAPING

SHAPER VISE ATTACHMENT — *Heinrich Tools, Inc, Racine, Wis.* Squarite permits operator to positively square work by simply securing piece into the vise attachment. Long pieces can be easily end-shaped to positive length because attachment clears the main shaper table allowing work to extend to the floor. Jaw lengths are from 10 to 15 in.; jaw openings 6 to 8 in. (Nov 17, p243).



SHAPER—*Cincinnati Shaper Co, PO Box 111, Cincinnati 11, Ohio.* Special shaper machines two surfaces, at 90° to each other, in an irregularly-shaped casting. The special two-station fixture replaces the standard table and rail assembly. The 16-in. shaper is equipped with a cross-travel head. Extended toolholder has an automatic tool lifter (Aug 11, p138).



SHAPER — *Jersey Mfg Co, 407 Livingston St, Elizabeth 1, NJ.* Improved K-150 form and punch shaper makes irregularly shaped stamping and electrode punches of high precision (±0.00025 in). The larger dividing head with autcmatic circular feed permits the machining of radii and angles automatically. Operations can be checked with the special built-in 30-power microscope (Feb 24, p161).

WAY PROTECTORS—*A & A Mfg Co, 712 S 12th St, Milwaukee, Wis.* Way protectors, available for long, wide tool beds, have aluminum bridges built into neoprene-base materials. They can open to 90 ft on both sides of the column and close to 24 in. Protection may be applied in both horizontal and vertical positions (Sep 8, p142).

BENCH SHAPER—*South Bend Lathe Works, South Bend 22, Ind.* Improved 7-in.-stroke bench shaper is equipped with an automatic pressure lubrication system to provide smooth operation at high speeds. Stroke rates range from 42 to 195 spm and cutting speeds from 3 to 114 fpm. Power cross feeds range from 0.002 to 0.012 in. with a maximum travel of 9½ in. (Jun 30, p108).

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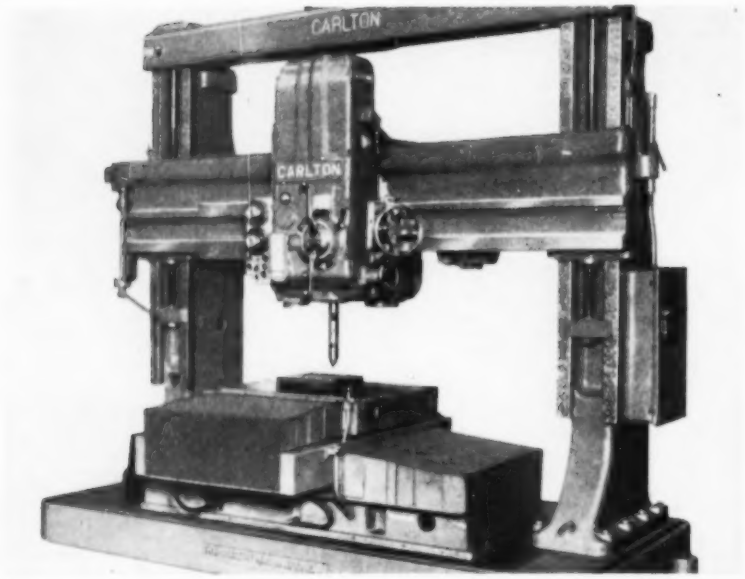
DRILLING



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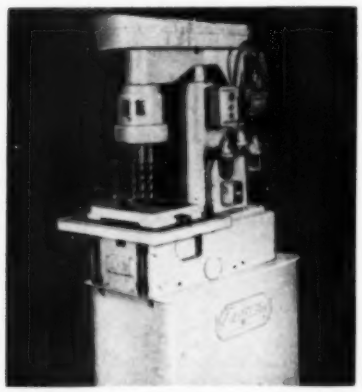
DRILLING AND BORING MACHINE —*Carlton Machine Tool Co, Cincinnati 25, Ohio.* Model 3 AR rigid vertical drilling and boring machine is reported to be the first double-box-column unit produced for use with automatic positioning tables. Specifications include vertical rail travel of 27 in.; vertical spindle travel (in head), 18 in.; horizontal travel of head on rail, 28 in. There are 36 spindle speeds ranging from 1 to 100 rpm and 18 feeds ranging from 0.004 to 0.125 ipr (May 5, p148).

DRILLHEAD ATTACHMENT — *Thriftmaster Products Corp, 1016A North Plum St, Lancaster, Penna.* Extension spindle bracket assembly has been designed for use with Thriftmaster universal joint drillheads. Unit provides a 4½-in. extension of the maximum adjustment and permits drilling under and beyond the flange of the drillhead body. Operation is at same maximum speed and capacity as the standard spindle bracket assemblies (Jul 28, p104).

ADJUSTABLE DRILLHEAD—*Errington Mechanical Laboratory, Inc, Staten Island 4, NY.* Adjustable drillhead features a weight reduction of up to 50% over previous adjustable drillheads. It has over ⅝-in.-drill capacity and is made with two, three or four spindles. It is designed primarily for use on drill units as well as bench model drillpresses where space is limited (Jul 14, p122).



DRILLING MACHINE — *Zagar, Inc, 23886 Lakeland Blvd, Cleveland 23, Ohio.* New 22-in. air-oil-feed drilling machine handles larger work and heavier sections on a wider variety of materials. Thrust capacity is 2000 lbs with compressed air at 80 psi. Unit is designed to mount a 215-frame motor. Controlled or slow feed of ram can be adjusted from zero to full 6 in. (Oct 6, p130).

BENCH-TYPE DRILLPRESS — *Distributed by Olivetti Corp of America, Machine Tool Div, 42-33 Northern Blvd, Long Island City, NY.* Model T6-B features 0 to 7/32-in. capacity, hydraulic head raising, sensitive hand feed controls with adjustable spring return, and a precision spindle. Machine is operated by a two-speed, ¾-hp motor permitting eight speeds from 3600 to 12,000 rpm (Mar 10, p170).

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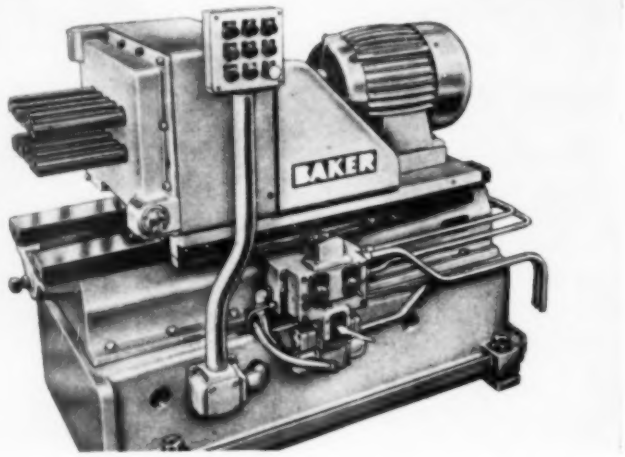
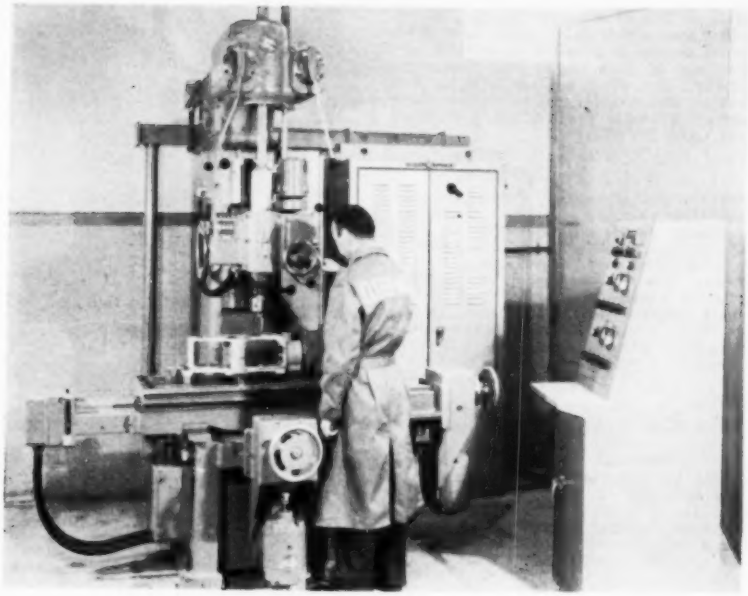
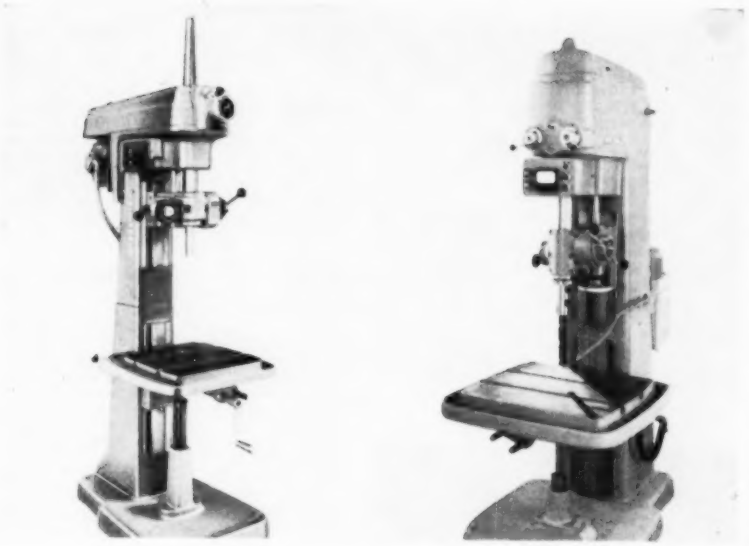
DRILLING AND TAPPING MACHINES—*Baker Bros, Inc, 1000 Post St, Toledo, Ohio.* Line of hydraulic drilling and tapping machines includes both vertical and horizontal models. A wide range of capacities are available. Interchangeable heads include 21 different sizes of adjustable spindle heads and 27 fixed center heads. Vertical machines have stroke of 18 or 27 in.; horizontal machines have 18-, 27-, or 40-in. stroke (Oct 6, p127).





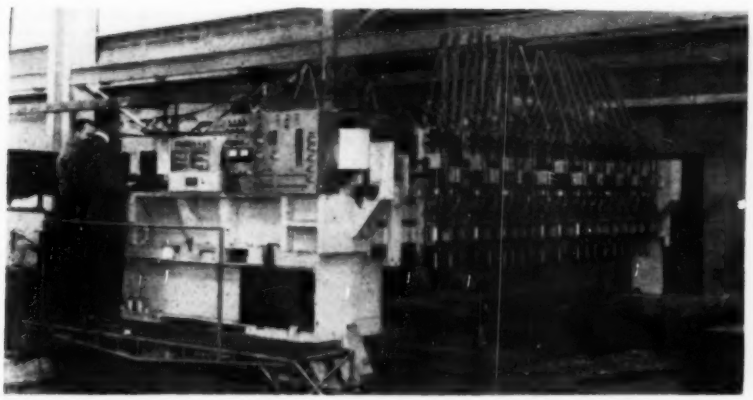
TAPE-CONTROLLED LAYOUT DRILLING MACHINE — *Cleereman Machine Tool Corp, Green Bay, Wis.* A GE numerical positioning control has been added to company's standard layout drilling machine. Numerical data are all digital and dimensions can be read directly from engineering drawings. For simpler jobs, digital dials can be used. Hole positioning accuracy is ±0.0005 in. Maximum number of positioning cycles is 20 per min. Table travel is 14 x 28 in. (Jun 16, p125).

TEMPLET DRILLING MACHINE — *Wales-Strippit Co, 200 S Buell Rd, Akron, NY.* Machine eliminates height gage layout and common errors in drilling sheet metal templets. By means of a precision ground leadscrew and dial which can be read to 0.001 in., measurements can be made to a high degree of accuracy. A built-in bend allowance calculator permits drilling in the flat with proper compensation for material stretch around bends (Apr 21, p186).



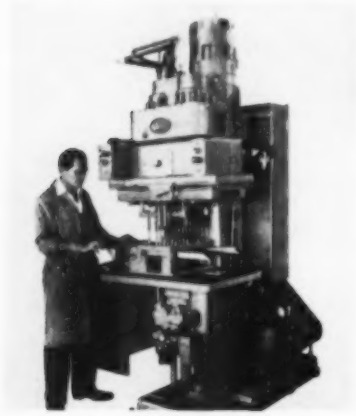
SELF-FEEDING DRILL — *Buckeye Tools Corp, 5023 Springboro Pike, Dayton 39, Ohio.* Self-feeding drill, capable of drilling, tapping, reaming, counterboring and countersinking, has a capacity of 3/16 in. and a stroke length of 2 in. Unit can be adapted to many automated operations. It can be operated through solenoids, time switches or any similar device, including trip mechanisms actuated by the parts to be worked (Apr 21, p276).

SLIDING HEAD DRILLS — *Cincinnati Lathe and Tool Co, Cincinnati 9, Ohio.* Medium-duty models (left), available in 16 and 24-in. sizes, have 1-in. drilling capacity in cast iron. Spindle speeds range from 450 to 3000 rpm with 1800-rpm 1-hp motor. Power feed is optional. Heavy-duty models (right), available in 21 and 25-in. sizes, have 1¼-in. drilling capacity. Speeds range from 60 to 1825 rpm with the 1800-rpm 3-hp motor. Power feed is standard equipment on heavy duty models (Feb 24, p150).



DRILLPRESS SPEED REDUCER— *Rockwell Mfg Co, Delta Power Tool Div, 496 N Lexington Ave, Pittsburgh 8, Penna.* Speed reducing device for Delta 20-in. drillpress permits machines to perform slow speed operations. Using 5-pulley drillpress drive, speed range is 70 to 1700 rpm with 1140-rpm motor and 105 to 2600 rpm with 725-rpm motor. Known as the Slo-Speed attachment, device fits machines with No. 2 or No. 3 Morse Taper spindles (Oct 6, p136).

DRILLING MACHINE—*Valley Engineering Corp, 15th & Elm Sts, Easton, Penna.* Inline multiple drilling machine has 18 vertical drilling heads on front rail, two vertical and four horizontal heads on back rail. Machine moves over bed at low speeds of 12 to 20 ipm or at high speeds of 40 to 55 fpm. Drillheads move on rail at a rate of 9 ipm. Unit has a max drill size of 1¼ in. and will handle work as large as 12½ x 120 ft. Maximum drillhead stroke is 4 in. (Jul 14, p124).



MULTI-SPINDLE MACHINE — *National Automatic Tool Co, Inc, Richmond, Ind.* Designed for simultaneous drilling and tapping of typewriter frames at a rate of 400 per hr, machine is easily adapted to other uses. It has 16 or 24 spindles. Half of the spindles, located on one side of head, are used for drilling, and are driven by standard motor. Those on other side are driven by high-reversal-duty hydraulic tapping motor (Jul 14, p120).

MULTI-SPINDLE DRILLHEAD — *Zagar, Inc, 25000 Lakeland Blvd, Cleveland 23, Ohio.* The eight spindles of this multi-spindle drillhead can be set to 1-in. minimum centers or 23-in. maximum. Hole patterns within the prescribed area are almost limitless. Capacity of individual spindle is 3/64 to ¾ in. The head is made of high-strength aluminum castings (Apr 21, p182).

BOX TABLE — *Lagoe Oswego Corp, 45 E 12 St, Oswego, NY.* Table is designed for radial drills, boring mills and other floor-type machines. It measures 30 x 24 x 20 in. and is priced at $325. Table is machined from a gray iron casting and is T-slotted (Mar 10, p189).

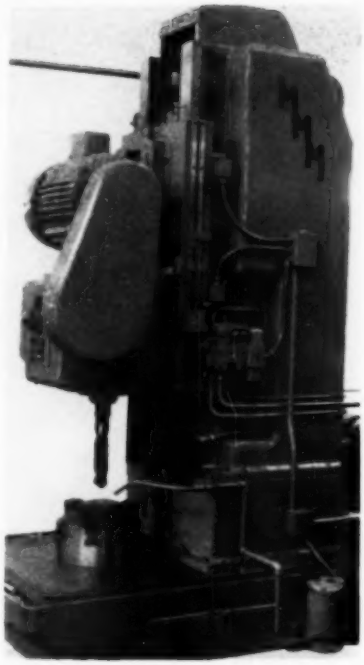
RADIAL ARM DRILLPRESS—*Shopmaster, Div of Energy Mfg Co, Monticello, Iowa.* This 24-in. radial arm drillpress makes it possible to drill in any position at any angle. For maximum safety, the tool has a locking key switch and a safety adapter that completely grounds the drillpress while in use (Aug 25, p106).

SPLINING HEAD — *Earle G Boyer, PO Box 4969, Philadelphia 19, Penna.* Splining head, called Universal Cost Cutter, permits ordinary drillpress or engine lathe to cut multiple splines or flutes, straight or spiral, on a short run or production basis. Tool can be used singularly or in multiple setups, in either horizontal or vertical position. Capacity ranges from ⅜ to 3½ in. (Mar 10, p194).

NUMERICALLY - CONTROLLED DRILL — *Hillyer Instrument Co, Inc, 331 Centennial Ave, Cranford, NJ.* Machine has rapid traverse speed of 100 ipm and an accuracy of 0.001 in. per ft. It is available with combined manual dial and punched tape controls or with dial control only. It is available in several models with capacity ranging from ⅝-in. drill with 2-hp spindle motor down to ¼-in. drill multi-spindle models (Apr 21, p182).

MULTI-SPINDLE DRILLHEAD—*Jersey Mfg Co, 407 Livingston St, Elizabeth, NJ.* Arbo-3 is an automatic, revolving, indexing unit that takes 2 to 5 tools simultaneously. Eight drilling speeds are available. Drilling capacity is ⅛ to 1 in.; tapping capacity, ⅛ to 15/16 in. (Dec 15, p131).

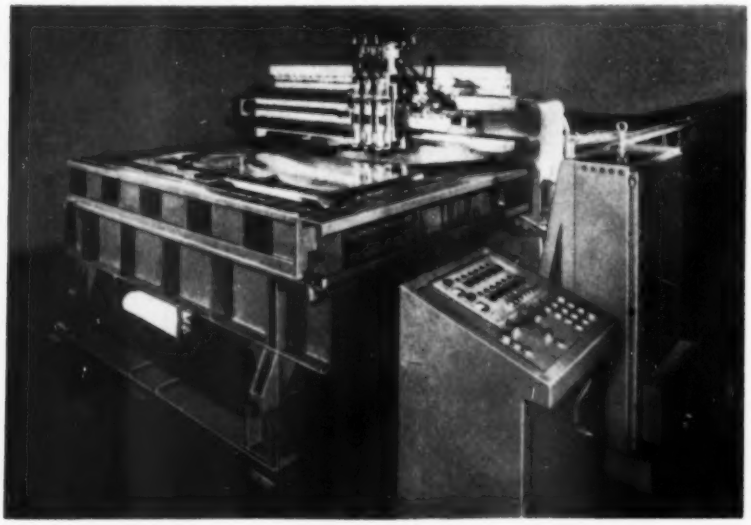
RADIAL DRILLS — *Distributed by Morey Machinery Co, Inc, 383 Lafayette St, New York 3, NY.* Model AJ35 radial drill, a product of Ajax Machine Tool Ltd, Halifax, England, is available in two sizes, 36 and 48 in., and has spindle speeds from 100 to 1500 rpm. Ajax Model AJ4 radial drill has speed ranges of 62 to 744, 95 to 1140 and 126 to 1500 rpm. It is made in 4, 4½ and 5-ft models (Mar 10, p174).



DRILLING AND BORING MACHINES—*Motch & Merryweather Machinery Co, 1250 E 22 St, Cleveland 17, Ohio.* These vertical machines are available with capacities up to 60 hp and in 15- and 30-in. strokes. Vertical slides are 26 in. wide, 48 in. long and 20½ in. across the ways. An outstanding feature of these automatic cycle machines is their accommodation of many types of heads, fixtures, indexing tables and bases (Sep 8, p129).

DRILLPRESS TABLE—*Chicago Tool and Engineering Co, 8383 S Chicago Ave, Chicago 17, Ill.* No. 192 cross-slide milling table is 18 in. long and 9⅝ in. wide. Longitudinal travel is 11 in.; cross feed is 6½ in. Designed for use on drillpress, the table has a machined and ground work surface with center keyway and two T-slots. Table is equipped with stops for both cross feeds. Swivel base is also available (May 5, p158).

CAM FEED — *Edlund Machinery Co, 128 Huntington St, Cortland, NY.* Cam feeds, for medium to large production drilling runs, controls amount of travel up to 3 3/16 in. including rapid advance and feed. Feed cycle is started by push-button or foot switch; feed is engaged through an electric DC magnetic clutch; and the cycle is stopped automatically at end of operation by a limit switch (Mar 24, p158).



NUMERICALLY CONTROLLED DRILL—*McKay Machine Co, Youngstown, Ohio.* A two-dimension, point-to-point, numerically controlled drilling machine, the 2DNC McKaymatic is capable of handling workpieces 8 ft wide by 16 ft long. Designed to eliminate templets and layout time, the machine has a gantry-type drill carriage to conserve floor space and a three-unit drillhead which permits selection of three different sizes of drill or counterboring tools (Jul 14, p122).

GUN DRILLING MACHINE—*Gerrad Co, 10819 Copeland Ave, Box 26, Hales Corners, Wis.* Machine has spindle speeds of 250 to 10,000 rpm and spindle feeds from 0.3 to 40 ipm. A rapid traverse of 225 ipm is provided in both directions. Cycle consists of rapid advance of tool to work, reduction of feed rate to the desired drilling rate, feed through the work, withdrawal at rapid traverse, braked stop (Nov 3, p140).

DIESEL CYLINDER HEADS — *National Automatic Tool Co, Inc, Richmond, Ind.* Heads are machined by multiple-spindle drilling machine. Fuel injector body holes are machined in both 4- and 6-cylinder heads. Machine is equipped with automatic 3-position index table, hydraulically operated front to rear. Machine, designated Natco C4A Holesteel, has 28 x 36-in. cluster box head with 18 spindles. Production is about 15 parts per hr (Oct 20, p206).

OVERHEAD DRILL MOUNT—*Delta Power Tool Div, Rockwell Mfg Co, 490 N Lexington Ave, Pittsburgh 8, Penna.* Accessory consists of a carriage and column which may be mounted with a standard 20-in. Delta drillhead and its raising mechanism on a jib crane or similar type track. The price of the accessory is approximately $128 (Aug 25, p108).

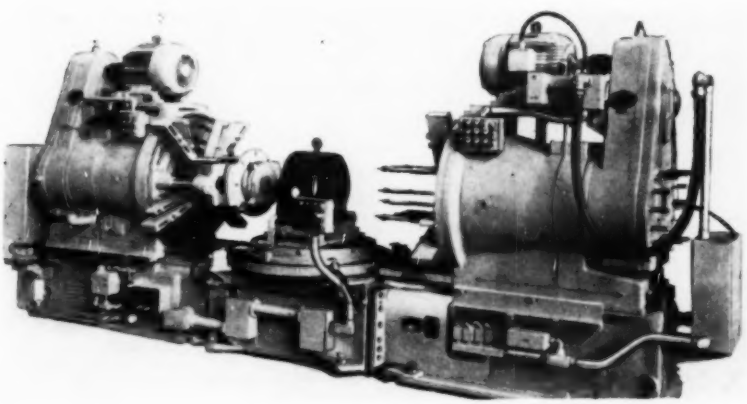
MULTI-SPINDLE HEAD—*Zagar, Inc, 23886 Lakeland Blvd, Cleveland 23, Ohio.* Multi-spindle head accommodates from two to ten spindles in sizes of 7, 10½, 12½ and 15½ in. Bolt circles up to 23 in. diameter allow almost any pattern to be drilled or tapped within a given circle. Spindles are driven by a crank-type driveshaft. Spindle arms can be changed rapidly (Jun 30, p108).

DRILLING AND TAPPING MACHINE—*Distributed by Eric R Bachmann Co, 27-11 41st Ave, Long Island City 1, NY.* German-built machine has a unit-system spindle carrier making it possible to combine a number of spindle units in any position around an indexing table for semi-automatic drilling and tapping. Standard feed, second feed, dwell period, jump power traverse, step control for deep-hole drilling, and rapid return are available (Jul 28, p112).

DRILLING MACHINES—*Lennox Tool & Machine Builders, Lima, Ohio.* Lennox-Demco sensitive drilling machines are available in one-, two-, three-, four- and six-spindle models. Capacity of current models is 1 in. in cast iron and ⅝ in. in mild steel. Specifications include 12-in. center distance, 7-in. spindle travel and 17-in. table travel (Sep 8, p134).

DRILLING-TAPPING MACHINE — *Batchelder Engineering Co, Inc, 125 Main St, Springfield, Vt.* Beco model 409 fully automatic, hopper-fed drilling and tapping machine accurately positions and securely holds rivets and other similar parts for such secondary operations as drilling or tapping. The unique feature of this machine is that the heads of the workpieces are clamped axially, eliminating any possible distortion which could cause the tool to weld to the part (Aug 11, p126).

DRILLING MACHINES — *Motch & Merryweather Machinery Co, Avey Div, Cincinnati 1, Ohio.* Automatic machines are available in three models, 2 to 5 hp, with No. 2, 3, or 4 Morse taper. Units are furnished with variable speed or six adjustable speeds and four standard rates of feed. When power feed spindle is engaged, the quill feeds down to a predetermined depth, whereupon regular feed rate takes over and feeds to desired depth with rapid traverse return (Mar 10, p159).



MULTI-SPINDLE DRILL — *Represented in US by Stanley Sheppard, 30 Church St, New York 7, NY.* German made Alzmetall No. 4 is available with 1, 2, 3, or 4 heads. Rigid beds and solid bases are reported to assure accuracy. Table size is 73 x 17. Maximum distance between spindle and table is 18½ in. (Apr 21, p197).

TURRET DRILL—*Burg Tool and Mfg Co, 15001 S Figueroa St, Gardena, Calif.* Radial turret drill, built from standard Burgmaster parts, is arranged for automatic center drilling, drilling and tapping of bolt circles having 8, 13 and 16-hole patterns. Bolt circles are of different diameters and at different levels on a dome-shaped aluminum part. Drill capacity in mild steel is ¾-in. dia; ⅝-in.-dia tapping capacity (Aug 25, p110).

MINIATURE DRILLHEAD—*Bellows Co, Akron 9, Ohio.* Slightly larger than a carton of cigarettes, Model 22A drillhead is capable of many machining operations on softer metals. It will drill, tap, ream, spot face, countersink and counterbore. The unit can be mounted in any position, singly or in groups. Stroke is adjustable throughout 2-in. range. Drilling capacity is from a No. 80 drill to a 3/16-in.-dia drill in mild steel (Sep 8, p134).

DRILLING TABLE—*Edlund Machinery Co, 128 Huntington St, Cortland, NY.* Power table for drilling machines is latest in company's line of drilling and tapping accessories. One lever controls all movements: One position raises the table, another lowers it, and a third locks it in position. Limit switches control both top and bottom limits of travel (May 5, p151).

GUN DRILLING MACHINE — *Crescent Tool & Machine Co, 25125 W Outer Drive, Melvindale, Mich.* Hole concentricity, squareness, finish, and size are held to critical tolerances on drilling unit. Except for load and unload, entire operation is automatic. Unit handles two parts simultaneously and is capable of drilling holes from 0.187 to 0.750 in. dia. Spindle speed ranges from 2000 to 8000 rpm. Feed rate varies from 0.0001 to 0.010 ipr; feed stroke from 1 to 12 in. (Nov 3, p131).

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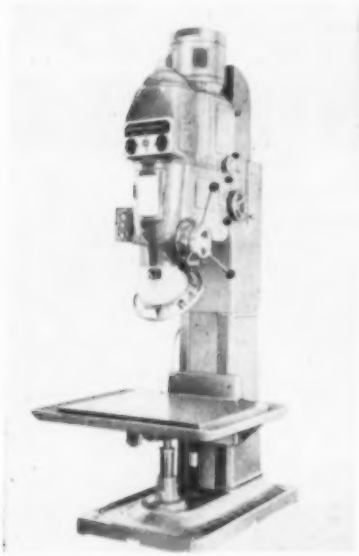
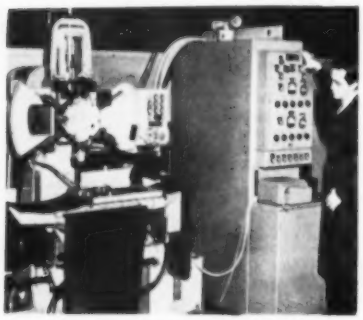
ELECTRIC MOTOR FRAMES — *National Automatic Tool Co, Richmond, Ind.* Frame sizes 360 through 500 are drilled and tapped on machine that has two adjustable multi-spindle heads and a 4-position index table. Unit also drills the brackets for these frames. Table is provided with four bushed holes for use in locating the fixtures, T-slots for bolting them down, and a revolving air connection so that air-clamping fixtures can be used (Mar 10, p160).



TURRET DRILLING MACHINE — *Howe & Fant Inc, 20 Fitch St, East Norwalk, Conn.* Model B turret drilling machine has capacity of 1 in. in steel, and offers pre-selective, infinitely adjustable power feed and optional power indexing. Quill travel is 9 in. Spindle speeds on each of the six turrets are infinitely adjustable from 125 to 2000 rpm. Spindle feeds are infinitely adjustable from 0.0025 to 0.0235 ipr (Apr 21, p196).

HEAVY-DUTY DRILL — *Represented in US by Stanley Sheppard, 30 Church St, New York 7, NY.* Alzmetall AB4/SJ is a German-made machine which swings 27 in., is powered by a 3-hp motor, and has a capacity of 1¾ in. in cast iron. A great range of speeds and feeds are said to be available. Specifications include No. 4 Morse taper spindle hole, spindle travel of 6¾ in., and a column dia of 6⅜ in. (Apr 21, p267).

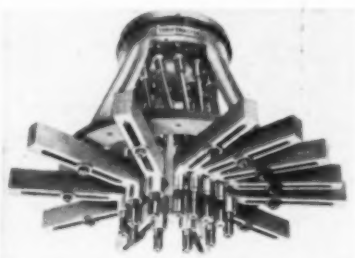


TAPE-CONTROLLED TURRET DRILL—*Burg Tool Mfg Co, Gardena, Calif.* The six-spindle Model 2 BHT turret drilling machine is numerically controlled through a General Electric two-motion numerical positioning unit. Designed specifically for automating small-lot production jobs, the machine is reportedly capable of handling 95% of all basic drilling requirements with tools up to ¾ in. dia in mild steel (Dec 1, p144).

DRILLING MACHINE—*Edlund Machinery Co, 128 Huntington St, Cortland, NY.* Model 2G gun-type drilling machine produces straight, accurate holes at production rates in a single operation. The machine has a ⅝-in. capacity. Reaming is often eliminated because hole finish of from 4 to 8 mu-in. can be obtained; size can usually be held to within a few ten-thousandths (May 19, p150).

SPECIAL DRILLING MACHINE—*Kingsbury Machine Tool Corp, Keene, NH.* Circular plates for refrigerant compressors are drilled on seven-unit, nine-spindle automatic machine. Three axial and 18 radial holes are drilled. Production is 100 parts per hr. Work fixture indexes three times for each part. With each index six horizontal units drill six radial holes. Vertical unit clamps part and drills three axial holes (Sep 22, p144).

DRILLING ATTACHMENT — *Jersey Mfg Co, 407 Livingston St, Elizabeth, NJ.* Drill-Tru drills deeps holes accurately and concentrically from 0.004 to 0.1969 in. dia. Precision collets instead of bushings hold the drills, reducing setup time and eliminating costly tooling time. Attachment is available for B&S Nos. 00, 0 and 2 automatic screw machines using turret driving mechanisms (Apr 21, p255).



DRILLHEADS — *Thriftmaster Products Corp, 1016A N Plum St, Lancaster, Penna.* Universal-joint-type drillheads are now available in standard sizes up to 12 spindles. Full ball-bearing construction is standard but, for close center distance operations, bronze-bearing mounted spindles can be supplied. The full ball-bearing and bronze-bearing spindles are interchangeable to provide complete flexibility (Jan 13, p160).

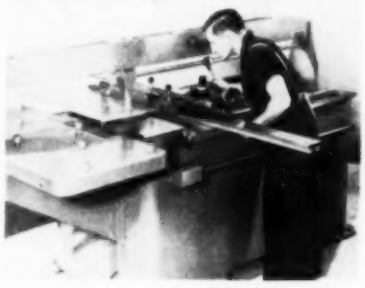
MACHINE HEADS — *Le Maire Machine Tool Co, 2657 S Telegraph Rd, Dearborn, Mich.* Model SU-5 way-type hydraulic units can be mounted either horizontally or vertically on machines for drilling, reaming, milling, boring, chamfering. Features include variable-delivery pump, hardened and ground ways, automatic lubrication, and automatic spindle speed changes (Dec 15, p130).

DRILLING AND TAPPING UNIT—*Universal-Automatic Corp, 9545 Ainslie St, Schiller Park, Ill.* Two-spindle horizontal opposed drilling and tapping machine is designed to handle second operations on screw machine parts, die castings, stampings, or headed parts. Spindle speeds range from 500 to 10,000 rpm. Capacity includes 0.020 to ¾-in. drilling and up to ¾-in. tapping in mild steel (Dec 1, p144).

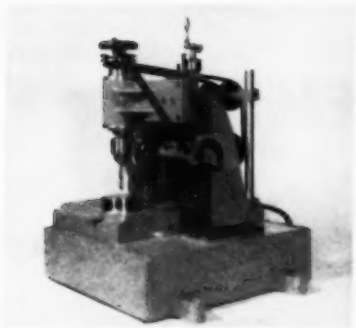
DRILLING AND TAPPING HEADS — *Chicago Quadrill Co, 1846 Busse Highway, Des Plaines, Ill.* Two new sizes of 4-position drilling and tapping heads, known as Quadrills have been added to company's line. Heads have an expanded quill sleeve designed to fit the larger size quills on 15- and 20-in. Delta drillpresses. Quadrills drill, ream, countersink and counterbore on one setup (Mar 24, p154).

DRILLING-TAPPING HEAD — *Dumore Co, 1300 17th St, Racine Wis.* Multi-spindle drilling and tapping attachment, designed for Dumore Series 24, 26 and 28 automatic drill units, is available in two-, three-, and four-spindle models. Each spindle has a drilling capacity of ¼ in. in steel. Spindles can be adjusted to reach a 3⅞-in.-max bolt circle; minimum center distance is ⅞ in. Recommended spindle speed is 4000 rpm (Sep 8, p136).

WORKTABLE — *Galger Engineering & Mfg Co, Rockford, Ill.* Worktable designated Tilt-A-Turn incorporates the means for both angular and radial positioning of workpieces. In addition to providing 360° rotation and eight equally spaced radial locating holes, the cradle-type design of the table permits tilting the work in a number of different planes, from horizontal to vertical (Feb 24, p171).

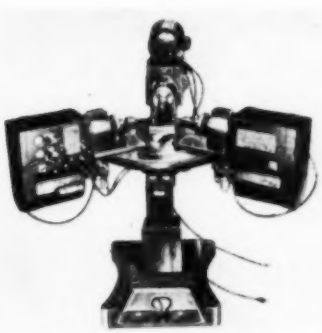


TEMPLET DRILLING MACHINE — *Wiedmann Machine Co, Hicks Coordinator Div, Wissahickon Ave, Philadelphia 32, Penna.* High-speed Coordinator machine locates and drills holes in templets to within 0.002 in. Machine can be used for making drill jigs, simple fixtures and other precision work in flat sheet metal or plate. It is suited for templets up to 36 x 42 in. for company's turret punchpresses and other equipment. Hole sizes range from 1/16 to ⅜ in. (Feb 24, p154).



BENCH DRILLPRESS—*F W Derbyshire, Inc, 157 High St, Waltham 54, Mass.* Unit is designed for operations where drill must be held accurately in a collet. Model illustrated is using a Jacobs No. 1A drill chuck; it also takes Magnus-Elect collets. Base is 13 x 13 in.; throat depth, 3½ in.; max height from table to top of column, 15 in.; from top of table to headstock, 4 in. (Nov 17, p238).

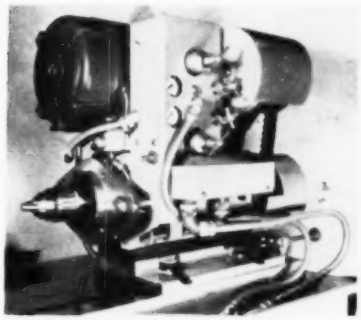
TURRET DRILL—*Burg Tool Mfg Co, Burgmaster Corp, 13226 S Figueroa St, Gardena, Calif.* Floor-model turret drill is designed for drilling, tapping, counterboring, reaming or otherwise machining small holes (up to ¼ in. in steel). The six-station turret is power indexed, rotates itself, and only the spindle in use is in operation. Each spindle operates at its own preselected speed, anywhere from 350 to 6200 rpm (May 19, p152).



DRILLING TABLE—*Dumore Co, 1300 Seventeenth St, Racine, Wis.* Compact stand provides mounting space for up to six tooling components for small parts machining in automatic production. Assembly consists of circular table which can be manually turned for fixture positioning, 27½-in. column, clamp for holding table, and base. Tables are available with or without Dumore automatic machining units (Jul 14, p121).

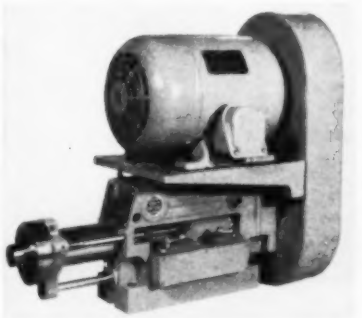
DRILLING MACHINE—*High Speed Hammer Co, 313 Norton St, Rochester, 21, NY.* Model AF-7B high speed sensitive drilling machine for production of small holes in any material has a capacity of No. 0 to 5/16-in.-dia drills. Vertical travel of head is 8 in. Spindle travel is 2⅜ in. Max distance chuck to base is 10⅞ in.; to table, 8¾ in. Speeds are 750, 1500, 3000, and 6000 rpm. Machine is 25 in. high (Oct 20, p234).

OPPOSED-SPINDLE MACHINE — *R E Ellis Engineering Co, 5001 W Fullerton Ave, Chicago 39, Ill.* Deburring, chamfering, spotfacing, drilling, and or tapping, reaming, and other related machining operations can be done individually, simultaneously, or in sequence on this automatic unit. Machine is furnished with two opposed Dumore Series 24 automatic drill units with drilling capacity of ⅜ in., tapping capacity of ½-13 in mild steel at 10 speeds from 400 to 7420 (Mar 24, p154).

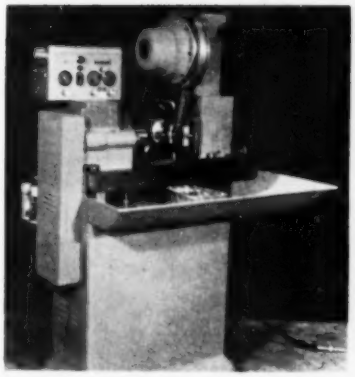


AUTOMATIC DRILL UNIT—*Batchelder Engineering Co, Inc, Springfield, Vt.* Model 505 offers stepless speed adjustment over the range from 600 to 12,000 rpm with a single-speed 1725-rpm motor. In addition to drilling and tapping, the machine is suited for single-point-tool hollow milling, end forming, pointing and chamfering. The tools use a No. 3 Jacobs taper and slip on in place of the drill chuck. Machine has a chuck capacity up to ½ in. (Dec 1, p139).

ADJUSTABLE DRILLHEADS — *Thriftmaster Products Corp, 1016 A North Plum St, Lancaster, Penna.* Universal joint, semi-standard heavy-duty models have precision machined spindle brackets for use with templets. Two ranges of adjustment are provided with rated capacities of either ½-in. drills in cast iron or ½-in. drills in steel. Two to six spindles can be furnished with heads having the smaller range and up to ten spindles for the larger heads (Dec 15, p138).

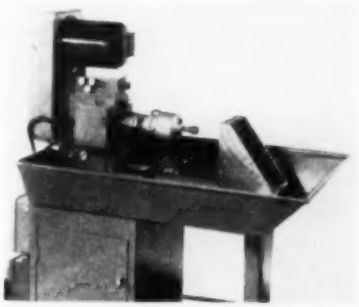


DRILLING HEAD — *Drillmation Co, 6500 E Eleven Mile Rd, Center Line, Mich.* Model 800-HD drilled a ¾-in. hole in a super alloy having a hardness of Rc 56-58 and a tensile strength of 310,000 psi. Using a standard carbide drill, machine drilled through the 1-in.-thick metal in 80 sec. Previous method (electric discharge) required 105 minutes (Apr 21, p199).



RIVET DRILLING MACHINE — *Snow Mfg Co, Bellwood, Ill.* Machine may be used with a hand-feed magazine for short runs, or with hopper feed for long runs. Production rate of 500 to 3200 per hr is said to be easily obtained, depending on hole size and material. Capacity varies from No. 72 drill (0.022 in.) to ⅝ in. with spindle speeds from 500 to 10,500 rpm. Tolerance on depth is within 0.002 in. (Dec 1, p154).

RADIAL DRILL—*Distributed by Cosa Corp, 405 Lexington Ave, New York 17, NY.* Donau DB 25 has a conveniently placed lever that controls both horizontal and radial displacement and all clamping operations. Operator can also effect pushbutton control of vertical arm displacement without removing his hand from this lever. Four different speed ranges cover speeds from 60 to 1700 rpm. Drilling capacity in solid steel is 1 in.; tapping power, ⅞ in. (Aug 11, p138).

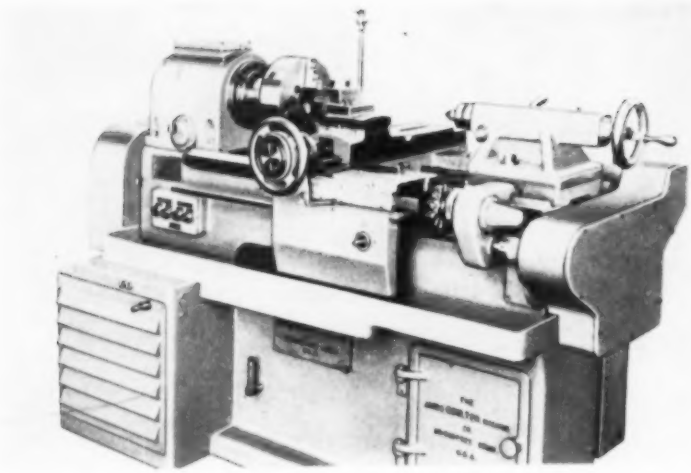


DRILLING AND TAPPING MACHINE—*Unimatic Machine Products, Inc, 9545 Ainslie St, Schiller Park, Ill.* One of the first in a series of automatic drilling and tapping machines, this single-spindle magazine-fed machine is designed to handle the large variety of second operation drilling, tapping, counterboring, deburring, countersinking, facing, reaming and hollow milling operations. Drilling capacity is from 0.020 to ⅜ in. in mild steel and up to ⅜ in. tapping (Sep 22, p135).

DRILLING ATTACHMENT — *Jarvis Corp, Middletown, Conn.* Drillspeeder has a maximum speed of 30,000 rpm. It is adaptable to any standard drill-press spindle, quickly converting it into a high speed drilling machine. The gear ratio is 4 to 1. The chuck capacity is from No. 80 to 5/32 in. (Mar 10, p158).

American Machinist 1959 PRODUCTION PREVIEW

TAPPING AND THREADING



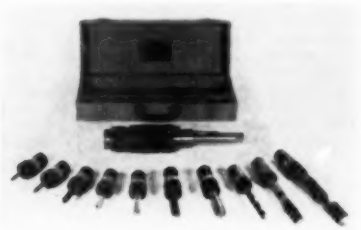
THREAD ROLLING ATTACHMENT — *Landis Machine Co, Waynesboro, Penna.* No. 14GA Lanroll thread rolling attachment, having a standard range of No. 5 to ⅝ in. and 1 16-in. pipe, can now be used for rolling up to ¼-in.-pipe and ½-in.-dia UNC or finer threads. The attachment must be specially machined to obtain the oversize range (Apr 21, p246).

THREAD ROLLING MACHINE — *Reed Rolled Thread Die Co, PO Box 330, Worcester 1, Mass.* Model B111 two-die, horizontal, cylindrical thread rolling machine is suited for both infeed and thru-feed thread and form rolling on large and small production runs. Work dia up to 2 in. can be handled by infeed method; up to ⅜ in. by thru feeding. Thread lengths up to 1⅞ in. can be rolled by infeed method; up to 20 ft by thru-feed method (Jan 13, p166).

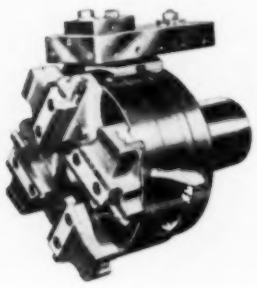
TAPPING MACHINE—*Kaufman Mfg Co, Manitowoc, Wis.* Model 25-20 is adaptable for both vertical and horizontal operation, has ¾-10 NC capacity in mild steel, and reversing motor-type head with 2½-in. leadscrew stroke. Speeds are available from 190 to 1200 rpm (Jun 30, p109).

DIE HEAD—*Toledo Pipe Threading Machine Co, 1445 Summit St, Toledo 1, Ohio.* Cam-type die head is offered in two sizes: No. 44, ⅛ to ¾-in. pipe, ¼ to 1⅛-in. bolt; and No. 66, 1 to 2-in. pipe and 1¼ to 2-in. bolt. Both models are fully adjustable to cut oversize, undersize, or standard threads (Jun 16, p158).

THREADING LATHE—*James Coulter Machine Co, 136 James St, Bridgeport, Conn.* Model B single-point, high-speed threading lathe is an automatic model capable of producing internal threaded pieces of up to 10 in. dia and external pieces up to 6 in. dia. It has 24-in. capacity between centers, max swing of 6 in. across cross-slide and 14 in. over bed. Spindle speeds are infinitely variable in the ranges of 250-1000, 150-600, 125-490 rpm (Feb 24, p154).



TAPPING HEAD — *Davis Boring Tool Div, Giddings & Lewis Machine Co, Fond du Lac, Wis.* Tapping head, known as the Tap Saver, can adjust to exactly the right driving force for each type of material, and can correctly control this force to the individual needs of drilling, reaming, counterboring, spot facing, and tapping operations. And it varies the torque for each different size of tap (Apr 21, p295).



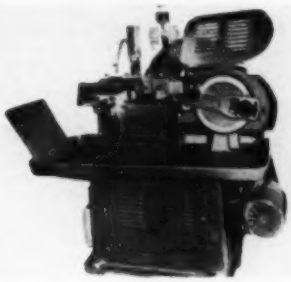
TAPER ATTACHMENT DIE HEAD — *Landis Machine Co, Waynesboro, Penna.* The 3-in. type C head for larger size automatic chucking machines, automatic turret lathes and turret lathes, is designed for cutting tapered threads of extreme accuracy of more than normal thread length or of high taper. With a range of ½ to 4-in. pipe and ¾ to 3-in. bolt, the head will produce a max. taper thread length of 2½-in. (Apr 21, p239).

MULTI-SPINDLE TAPPER — *Zagar, Inc, 2400 Lakeland Blvd, Cleveland 23, Ohio.* Heart of this nut-tapping machine is a 100-spindle gearless tapping head coupled with a vibratory hopper for almost completely automatic operation. Machine taps 10-32 nut blanks at the rate of 72,000 per hr. Blanks are manually loaded into the hopper, which has an agitating device that feeds 200 pieces into the jig cavities (Apr 21, p199).

TAPPING ATTACHMENT — *Procunier Safety Chuck Co, 18 S Clinton St, Chicago 6, Ill.* Leadscrew tapping attachment derives its power from standard drillpresses. Leadscrew assemblies can be interchanged in seconds and are available in any standard pitch from 20 to 96. Tap capacity is from No. 00 to 3/16 in. in steel, ¼ in. in softer materials. Max leadscrew travel is 1 3/16 in. (Jun 2, p128).

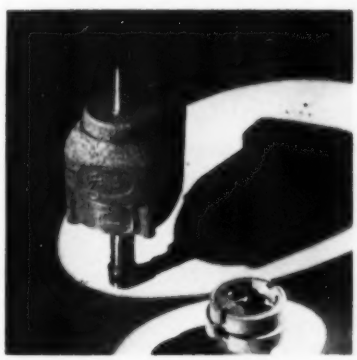
REVOLVING DIE HEAD — *Landis Machine Co, Church and Fifth Sts, Waynesboro, Penna.* The yoke-operated JN Landex revolving die head is used on automatic screw machines and other machines employing a live spindle. It does not incorporate a "floating" mechanism. Head is available in four sizes—½, 13/16, 1¼ and 2 in., having standard ranges of No. 4 to ½, No. 4 to 13/16, ¼ to 1¼, and ⅜ to 2 in. respectively (Oct 6, p126).

TAPPING ATTACHMENTS — *Tapmatic Corp, 845 W 16 St, Costa Mesa, Calif.* Tapmatic Models 400, 600 and 800 are designed for machines with reversing spindles—lathes, turret lathes, radials, jig borers, and screw machines. Floating axial movement eliminates need for lead pressure by operator during tapping cycle. Capacities of these units: Model 400, from No. 0 to 5/16 in.; Model 600, from No. 10 to ⅝ in.; Model 800, from 9/16 in. to 1 in. (Sep 22, p146).

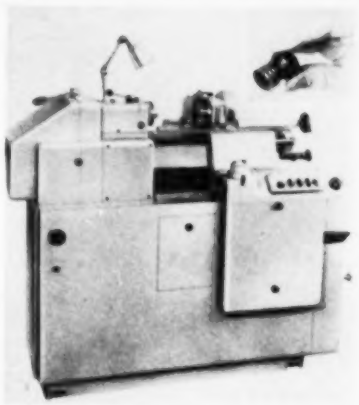


THREAD-ROLLING MACHINES — *Mettler Machine Tool, Inc, New Haven 11, Conn.* The Shuster thread rollers are the reciprocating die type, can roll threads, knurls, gimlet pointed wood screws, machine screws and similar products. Depending upon machine used, two- or three-inch lengths of thread may be rolled. Four machines are presently available; two are manually fed, and two hopper fed. Production rates range from 60 to 120 pieces per minute (Aug 25, p110).

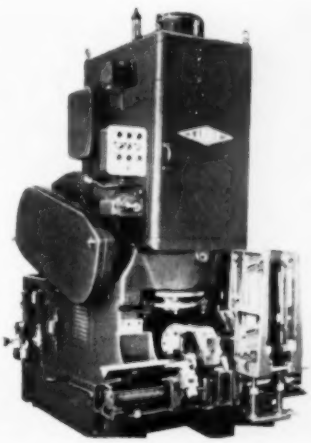
THREAD ROLL DIES — *Standard Pressed Steel Co, Thread Roll Die Div, Jenkintown, Penna.* Thread roll dies for producing external screw threads in fine and coarse thread series are available in all standard thread sizes from 6-32 to 1 in.-14. These aircraft quality dies are made of special alloy steel. Supplied in sets, dies are of the flat single-face type (Sep 8, p148).



TAPPING HEAD—*Jarvis Corp, Middletown, Conn.* Straight-line action of clutch, now standard on all models, offers a 100% driving surface, increasing power to twice that of former clutch. Basic design feature provides sensitive, rapid response to light pressure on the drillpress lever to insure easier, more accurate tapping (May 19, p173).

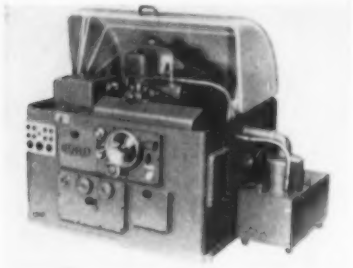


THREAD GENERATING MACHINE *Imported by Carl Hirschmann Co, Inc, 30 Park Ave, Manhasset, NY.* Swiss-made Jaggi MF-57 cuts both internal and external threads at a faster rate than thread chasers or grinders. Employing a principle known as "thread whirling," in which tungsten carbide tools whirl around the workpiece, the machine is reported to cut threads that are extremely accurate in pitch diameter and very smoothly finished (Nov 3, p136).

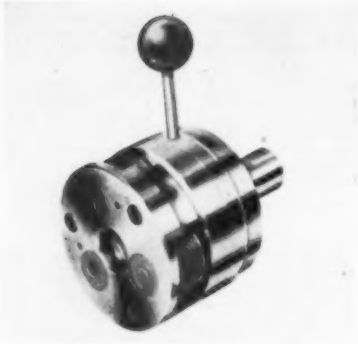


COUPLING TAPPER—*Landis Machine Co, Waynesboro, Penna.* Large couplings are tapped automatically on the Model 77TA coupling tapping machine. Machine handles couplings as large as 9⅝-in. long-thread casing couplings. Ten spindle speeds range from 7 to 56.8 rpm when using V-belt drive pulleys and ac constant speed motor. Other drives available (Aug 11, p122).

AUTOMATIC NUT TAPPER—*Distributed by Erich Lange Engineering, 1137 Cranford Ave, Cleveland 7, Ohio.* The two-spindle Nutap, made in West Germany, is furnished in four models ranging from No. 5 to ¼ in.; ¼ to 7/16 in.; ⅜ to ¾ in.; and ⅝ to 1¼ in. Features include positive pitch cams, gripping devices for cylindrical nuts, safety devices to prevent tap breakage (Sep 8, p144).

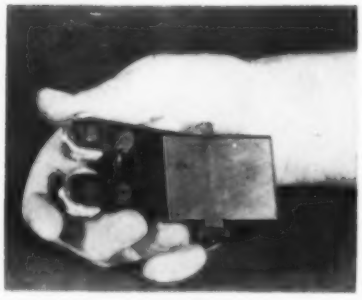


AUTOMATIC THREAD GRINDER—*Imported by Cosa Corp, 405 Lexington Ave New York 18, NY.* Reishauer RAG grinder (Swiss-made) is designed for precision thread grinding on small parts such as taps, thread gages, and small, fine-pitch worms. Machine features automatic feed compensation for decreased wheel diameter. Specifications include: maximum grinding length, 9¾ in.; distance between centers, 20 in.; max workpiece dia, ⅝ in.; pitch range, 6 to 90 threads per in. (Oct 6, p131).

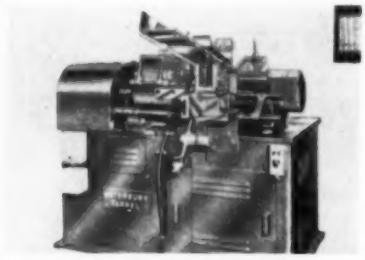


THREAD ROLLING HEADS—*Landis Machine Co, Waynesboro, Penna.* Heads are available in stationary and revolving styles. High speeds are possible, making heads ideal for use with carbide tooling. Both styles are self opening, and use replaceable helix angle bushings. One set of standard bushings (with "mean" angle) functions to roll both UNF and UNC threads. Tools are available in No. 5 series with 5/16 to ⅝ UNF and 5/16 to ½ UNC right-hand range (Apr 21, p181).

HAND TAPPER—*Grimes Engineering Corp, 1187 College Highway, Cheshire, Conn.* Tapper for producing precision threads in size range of from No. 0 to ½ in. can be used with drill-presses, lathes, jig borers, and vertical millers. Unit is furnished in a hardwood box, complete with adjustable chuck and chuck wrench. Model 44 has No. 8 to ½-in. chuck; Model 44A has No. to 5/16-in. Price: $30 (Jul 14, p128).

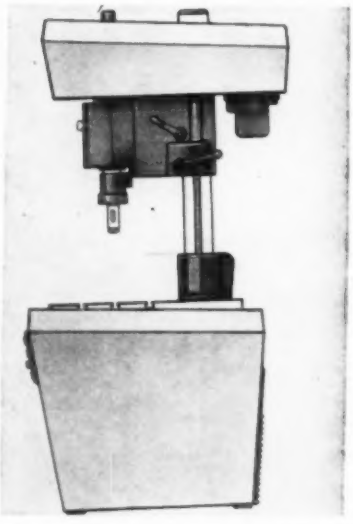


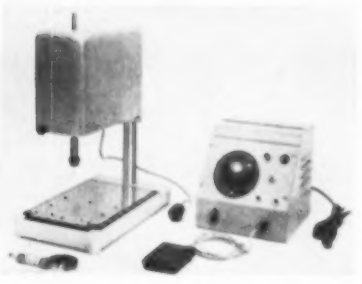
THREAD-ROLLING ATTACHMENT—*Sheffield Corp, Dayton 1, Ohio.* No. 250 Precision-Rol thread-rolling attachment for rolling threads up to ¼ in. OD can be used on the 00 Brown & Sharpe and the 9/16-in. Acme-Gridley without machine modification. It is designed for rolling threads from 0-80 to ¼-20 with maximum thread width of ½ in. (Aug 25, p103).



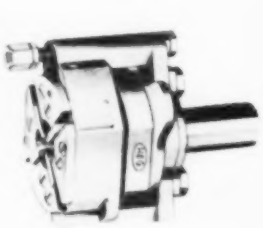
SCREW-CAP THREAD ROLLER—*Waterbury Farrel Foundry & Machine Co, Waterbury, Conn.* Medium screw-cap thread-rolling machine handles much larger shells at higher speeds than is possible on the present small machine. Machine is equipped with semi-automatic feeding and will thread shells from 7/16 in. dia x ⅝ in. long to 4½ in. dia x 4 in. long. With the feed mechanism removed, long tubes can be threaded (May 5, p149).

REVERSIBLE TAP DRIVER—*Scully-Jones and Co, 1901 S Rockwell St, Chicago 8, Ill.* Safe-Torque tap driver is reversible, making it ideal for tapping operations on machines which have no means of reversing the spindle. The gear-type reversing mechanism automatically engages the driver spindle and reverses tap rotation when machine spindle is raised (Apr 21, p184).





LEADSCREW TAPPING MACHINE—*Milman Engineering Co, 1831 Pontius Ave, Los Angeles 25, Calif.* Automatic tapping cycle is actuated by work itself. Machine uses only one master precision leadscrew yet it covers the entire range of standard pitches from 32 through 80 threads per inch in tap sizes No. 0 through No. 10. Tap stroke is adjustable from ⅛ to 2 in. and tapping speed is infinitely variable (Aug 7, p132).



ALUMINUM DIE HEAD — *Eastern Machine Screw Corp, Truman & Barclay Sts, New Haven 6, Conn.* H & G lightweight die head is available in Size 00, Style DMLN (alignment) type with a 7/16-in. normal capacity. Soon to be introduced is the Size 102, designed for the B&S No. 2 automatic. It will have a capacity of 1¼ in. dia in pitches not coarser than 10 (May 5, p151).

TAPPING MACHINE. — *Wisconsin Drill Head Co, Butler, Wis.* Production tapping machine is readily adaptable to single spindle use. Normally furnished with a flanged quill for multiple tapping head use, interchangeable single spindle noses are also available, with No. 1, 2 or 3 Morse taper adjustable adapters. Spindle speeds range from 220 to 1200 rpm. Leadscrews and leadscrew nuts cover range from six pitch to 32 pitch (Apr 21, p191).

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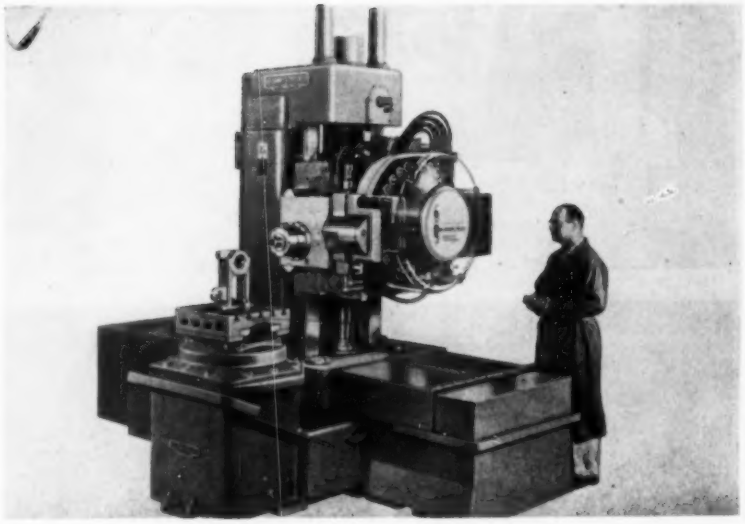
MILLING

TAPE-CONTROLLED UNIVERSAL MACHINE TOOL—*Kearney & Trecker Corp, Milwaukee 14, Wis.* The Milwaukee-Matic is capable of a wide range of machining operations—milling, drilling, tapping, boring. The Model II machine is designed to handle workpieces as large as an 18-in. cube. The most outstanding features are the simple control system, the automatic tool-change mechanism and the built-in indexing table (Dec 15, p129).

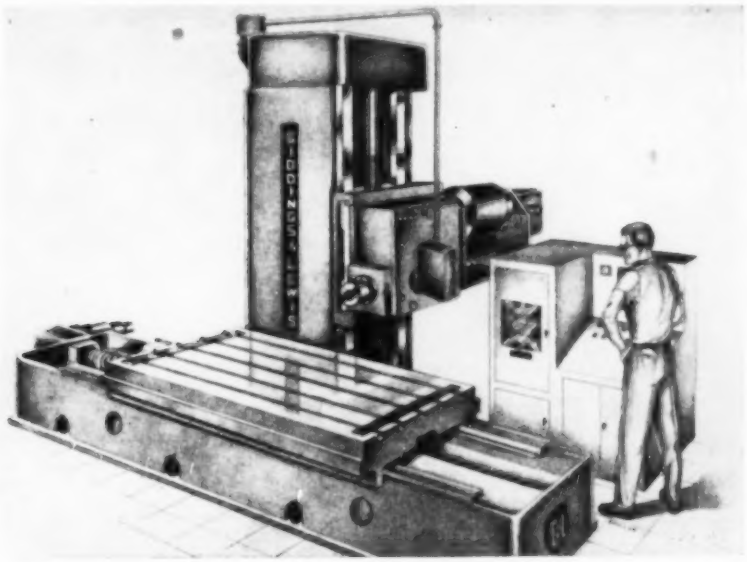


VERTICAL MILLER — *Tree Tool and Die Works, 1600 Junction Ave, Racine, Wis.* Model 2VG vertical milling machine has 12 speeds ranging from 50 to 2500 rpm; six geared changes in ram gear box, high and low range selection on head. Three dial-selected feed rates are offered—0.001, 0.0025 and 0.006 ipr. Table has feed rates of $\frac{3}{4}$, 1$\frac{3}{8}$, 2$\frac{3}{8}$, 4 and 7 ipm and rapid traverse of 70 ipm (Jan 13, 159).

3-D CONTOUR MILLER — *Tri-Ordinate Corp, Hoglund Engineering & Mfg Co, Berkeley Heights, NJ.* Twin-head indexing milling machine performs deburring and chamfering operations on turbine blades. In an 18-sec cycle, unit contours four corners of each blade root accurate to 0.001 in. Miller will meet tolerances as close as 0.0002 in., if necessary, working from templets. Each of the heads has two air-powered spindles with small cutters angled to chamfer the blade roots (Apr 7, p128).

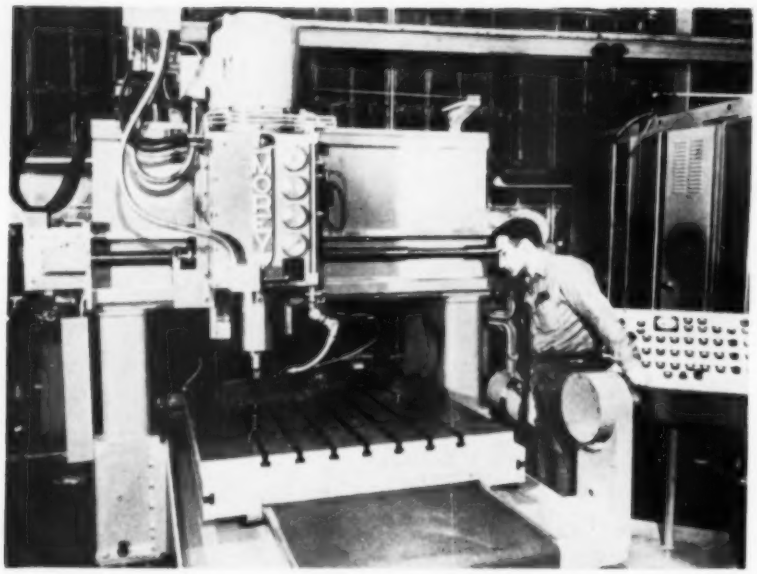
MILLING MACHINES — *Sundstrand Machine Tool Co, Rockford, Ill.* Sundstrand "C" Model Rigidmils, in both simplex and duplex designs, are available with spindle motors ranging from 7$\frac{1}{2}$ to 75 hp, table widths from 3 to 14 ft. Hydraulic tracing heads are available for work on nonferrous metals and an electronic tracer for milling in steel. Unit construction is featured (Jan 13, p157).

TRACER-CONTROLLED MILLER—*Pratt & Whitney Co, Inc, West Hartford 1, Conn.* Keller 4-axis automatic tracer-controlled milling machine is designed for profile milling of warped surfaces as encountered in many aircraft components. A modification of the BG-22 Keller, the new machine is equipped with a special milling head that can be tilted 20° above or below the horizontal position (May 19, p151).



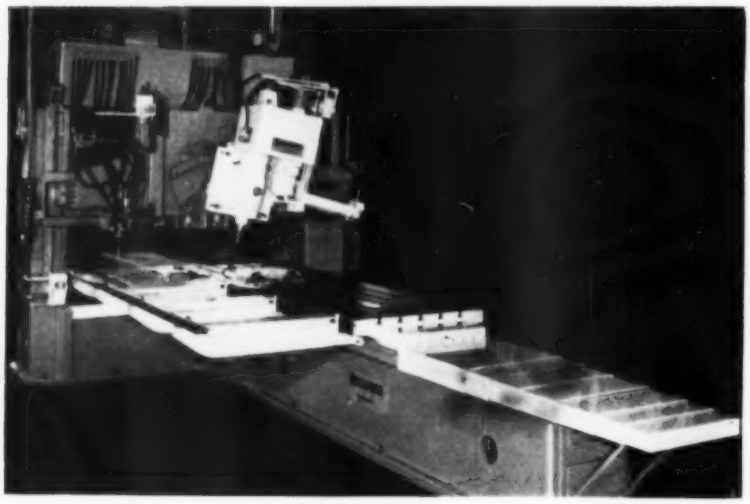
UNIVERSAL MILLING MACHINE—*Distributed by Morey Machinery Co, Inc, 383 Lafayette St, New York 3, NY.* Morey-Ram VSR2 Italian-made machine combines three different millers in one machine tool. Both the vertical and horizontal spindles can be used simultaneously. The vertical spindle has 16 speeds from 65 to 4750 rpm, automatic power feed both up and down. The horizontal geared head spindle is driven by its own motor, allowing 12 spindle speeds from 30 to 1400 rpm (May 19, p173).

NUMERICALLY CONTROLLED DIE SINKER—*Giddings & Lewis Machine Tool Co, Fond du Lac, Wis.* Under tape control, a DiMil can generate any defined surface. It can be programmed for a wide range of profile milling, including dies, molds, cams, templets, and many prototype and production parts. Both table- and floor-type models are available. Machines are controlled by a G&L Numericord continuous-path magnetic tape control system (Nov 3, p129).



NUMERICALLY - CONTROLLED MILLING MACHINE — *Morey Machinery Company, Inc. 383 Lafayette Street, New York 3, NY.* Morey A-50 profiler is equipped for continuous-path, three-dimensional control, with GE magnetic-tape control system. Spindle speeds range from 20 to 3600 rpm in 16 steps. Spindle travel is 12 in. Longitudinal table travel is 52 in. Both table and saddle provide feed rates from ¼ to 100 rpm; both rapid traverse at 200 ipm. Spindle feed can be varied from 0.0751 to 30 ipm and will retract at 60 ipm. And a new consideration where servo controls are involved—selsyn gearing is 0.1 ipr for each of the three feeds (Mar 24, p142).

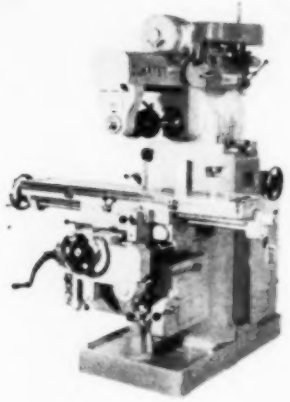
MILLING MACHINE — *Distributed by Robert E Morris Co, West Hartford 7, Conn.* Semi-automatic machine is equipped for continuous rotary milling of squares on a variety of small parts. Automatic downfeed to spindle head is synchronized with automatic table feed and automatic indexing of the 4-station rotary table. Feeds are adjustable up to 60 ipm; spindle speeds range up to 5000 rpm. Machine is manufactured by W H Nichols Co (Apr 21, p235).



DUPLEX BILLET SCALPER—*Consolidated Machine Tool Div of Farrel-Birmingham Co, Rochester 10, NY.* Billet scalper automatically machines aluminum billets 8 to 16 in. thick, 30 to 54 in. wide and 6 to 14 ft long. 14-ft billets can be machined on both sides in less than 90 sec. Machine is equipped with 75-in.-dia Wesson milling cutters that remove aluminum chips at a rate of 5000 cu in. per min. Preset insert blade cutters greatly reduce regrinding and setup time (Mar 10, p101).

3-D SWARFING MILL—*Rockford Machine Tool Co, 2500 Kishwaukee St, Rockford, Ill.* Machine mills the edges of aircraft or missile parts or sub-assemblies having compound surfaces. Movements in three axes are controlled from templets or master parts. Milling feed rates range from 0 to 50 ipm, with traverse rate of 85 ipm. Machine is available in sizes 30 x 24, 36 x 24, and 42 x 24 in., with stroke lengths of 6, 8, 10 or 12 ft (Dec 29, p76).

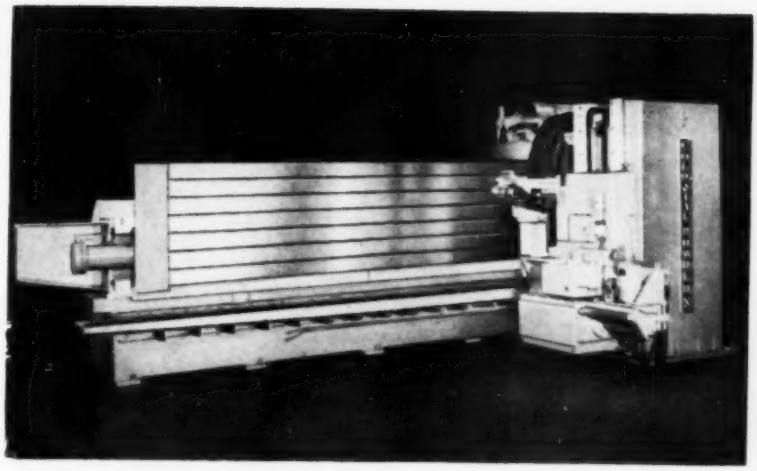
NUMERICALLY - CONTROLLED SKIN MILLERS—*Kearney & Trecker Corp, Milwaukee 14, Wis.* Designed for machining airframe wing skin sections and structural units from heavy aluminum plate or large forgings, this gantry-type miller is equipped with GE's magnetic tape control system. The machine is arranged for automatic slab, straddle, face and angle milling, and for pocketing and detailed sculpturing under 3-axis programmed control (Feb 10, p152).



VERTICAL MILLER — *Sundstrand Machine Tool Co, Rockford, Ill.* OM5 vertical Rigidmil has longitudinal, transverse, and vertical feed. Machine has a 50-hp vertical head mounted on a fixed column for maximum rigidity under heavy cuts. The saddle and table are also on a fixed base. Feed movements, feed rates and rapid traverse are all controlled from the pendant. Table movements can also be controlled from preset dogs, for automatic cycles (Jun 30, p107).

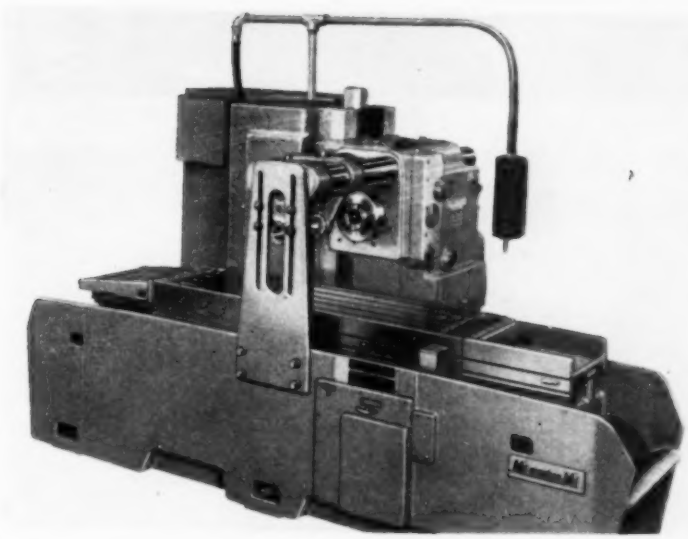
DUPLEX BILLET SCALPER—*Ingersoll Milling Machine Co, Rockford, Ill.* Designed to handle aluminum billets measuring up to 204 in. long, 6 ft wide and 2 ft thick (larger than any ingot now cast), this scalper uses 84-in.-dia carbide face milling cutters. Cutting speed is 15,000 sfpm to eliminate need for coolant. Machine pulls 2800 hp at max stock conditions and max feed rates. Elaborate safety features are built in (Oct 6 p92).

MILLING MACHINE — *U S-Burke Machine Tool Div, Brotherton Rd, Cincinnati 27, Ohio.* The Quartet combines a 5-hp horizontal spindle drive motor with an independently powered 2- or 3-hp heavy-duty vertical and angular spindle head. Machine performs four milling operations—horizontal, vertical, angular and universal. Both spindles have infinitely adjustable speeds. Vertical spindle has an infinitely adjustable feed rate, with 6-in. quill travel (Apr 21, p268).



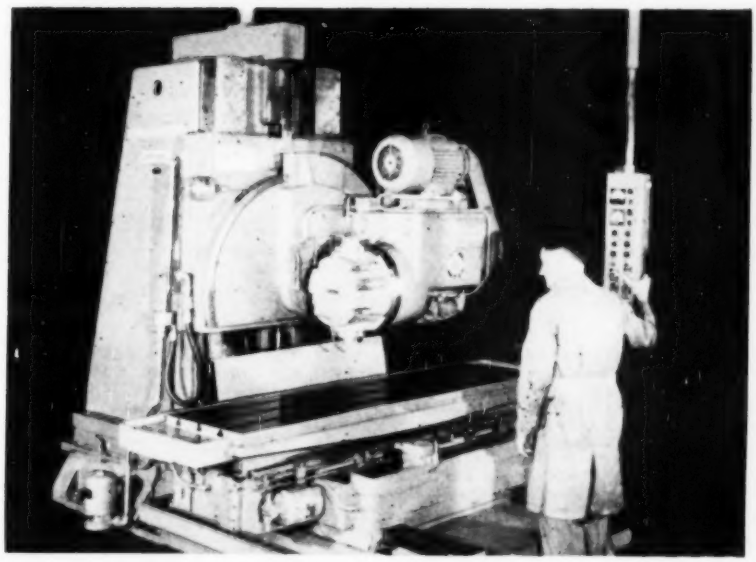
SCULPTURE MACHINES — *Colonial Broach and Machine Co, Colonial-Romulus Div, Parkgrove Station, Detroit 5, Mich.* Hydraulically driven machines are available in two-sizes—a 120-in.-stroke model and a 144-in.-stroke model. A variable speed drive provides spindle speeds from 36 to 1900 rpm. Spindle can be moved in-and-out and up-and-down at rates from 0.5 to 40 ipm. Horizontal movement of work and templet is infinitely adjustable over same range. (Jan 13, p162).

MILLING AND CENTERING MACHINE—*Motch & Merryweather Machinery Co, 1350 E 222 St, Cleveland 17, Ohio.* Model SMC single-end milling-and-centering machine prepares cut-off pieces of forged shaft or rod for subsequent turning or grinding operations. Machine has its milling head and center-drilling head mounted on a slide actuated by a pneumatic cylinder. Machine handles parts 4½ to 48 in. long and ⅝ to 3½ in. dia (Sep 22, p134).



SPINDLE — *DeVlieg Microbore, Div of DeVlieg Machine Co, 2720 W Fourteen Mile Rd, Royal Oak, Mich.* Replacement spindle adapts any Bridgeport milling machine for Flash-Change tooling that reduces down time on milling, drilling and boring operations. The new spindle is easily installed (Apr 21, p208).

MILLING MACHINE — *Kearney & Trecker Corp, Milwaukee 14, Wis.* Bed-type Mil-waukee-Mil provides automatic production milling by dialing the results directly from the blueprint. Operator programs machine functions on the Dial-a-Cycle control panel by phase-switch dials that control each machine function automatically. Seventy-two models are available, in both simplex and duplex types, with power ranging from 7½ to 30 hp (Oct 6, p129).

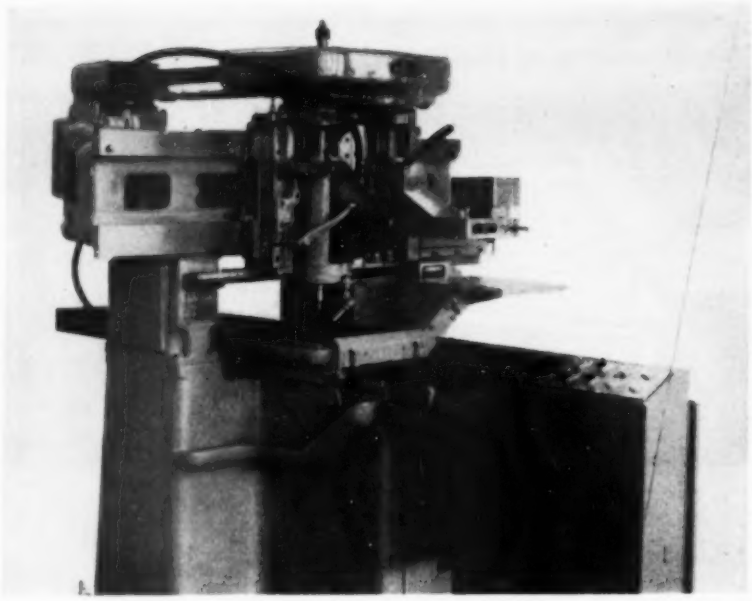


MILLING MACHINES — *Olivetti Corp of America, Machine Tool Div, 42-33 Northern Blvd, Long Island City 1, NY.* Italian AF-30 production milling machine is available in simplex, duplex and twin vertical head models. Cam-operated table measures 9 x 22 in. (Apr 21, p181).

MILLING MACHINE — *Imported by Bentley Industrial Corp, 41 E 42 St, New York, NY.* Victoria U2 Rapidmil has two speed ranges covering 30 to 1500 rpm, and feeds from 0.65 to 21.5 ipm. Other features include backlash eliminator, mechanical overloads, one-shot lubrication, power and rapid traverse in all directions (Sep 8, p138).

MILLING MACHINE — *Sundstrand Machine Tool Co, Rockford, Ill.* Omnimil combines rigidity of heavy-duty milling machine with range of boring mill, also adds versatility to an all-angle head. This 16-hp double-spindle head can be adjusted to any angle. The low-speed spindle for ferrous materials has speeds of 25 to 400 rpm; high-speed spindle for machining nonferrous materials has speeds of 250 to 4000 rpm (Sep 22, p134).

VERTICAL PROFILER — *Pratt & Whitney Co, Inc, West Hartford 1, Conn.* Incorporating spark-gap sensing elements, the Magnespark profiler operates from a sheet steel profile templet to produce any two-dimensional straight-line or irregular contour shape. Tracing speeds up to 60 ipm are possible and accuracy is reported to be better than that attainable with earlier profiling methods. For quantity production, automatic cycling is available (Jul 14, p119).



HYDROCOPY MILLER—*Imported by Cosa Corp, 405 Lexington Ave, New York, NY.* The Rigid ST-100 (Swiss-made) automatic hydrocopy blade milling machine handles jet engine, gas and steam turbine blades up to 16 in. in length of blade section. Available as a 2- or 3-spindle machine, it has completely hydraulic control. Sweep milling speed up to 40 ipm are possible. The 16 spindle speeds range from 24 to 420 rpm (Oct 6, p132).

MILLING MACHINE—*Distributed by Austin Industrial Corp, 76 Mamaroneck Ave, White Plains, NY.* Swedish-made SAJO Model 53A, is available in both plain and universal models. Specifications include a table working surface of 43¼ x 10¼ in.; longitudinal power feed of 28 in.; power feeds and power rapid traverse in all three directions; dial selection of feeds and speeds. Machine is equipped with a 5-hp motor drive (Jul 14, p128).

AUTOMATIC CONTOUR MILLER — *Onsrud Machine Works, Inc, Machine Tool Div, 7712 Lehigh Ave, Niles 31, Ill.* Onsrud A90-36A automatic contour milling machine provides electro-hydraulic drive for the critical feed components of multiple-feed milling heads so that production speed and accuracy can be maintained throughout a milling operation. Machine is 15½ ft wide x 105 ft long. Two gantry carriages hold six milling heads, with total of 560 hp (Mar 24, p148).

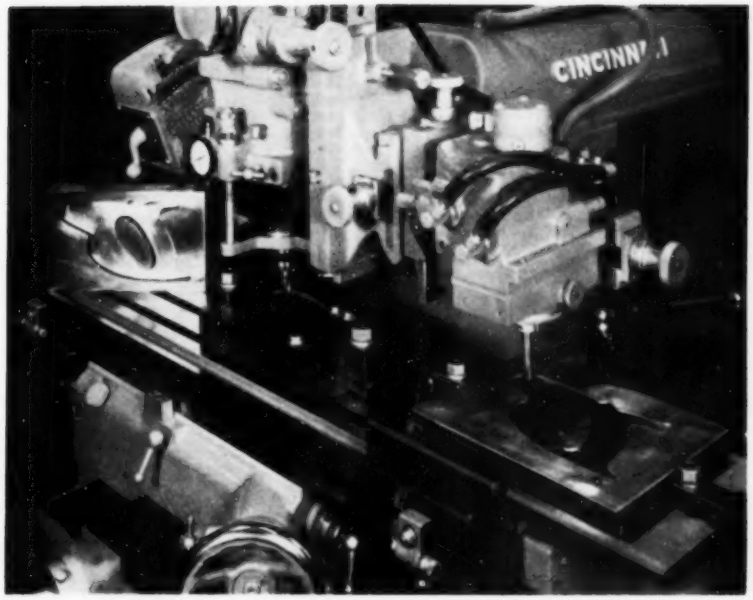
MILLING SPINDLE—*Futurmill, Inc, 6360 Highland Rd, Pontiac, Mich.* This multiple-speed, 50-hp spindle converts planers and other machines into high production milling machines. Speeds range from 225 to 1200 rpm. Milling spindle is designed for high metal removal on a range of materials including mild steel, cast iron, stainless and other high-heat-resistant steels (Nov 3, p136).

TABLE FEED — *U S-Burke Machine Tool Div, Brotherton Rd, Cincinnati 27, Ohio.* Mounted on a vertical milling machine, this 30-in.-stroke air-hydraulic table feed device provides rapid traverse approach, controlled cutting speed and distance, and automatic rapid retraction. For many product applications the automatic table feed can be coordinated to the operation of an air-actuated workholding fixture or vise (Apr 21, p240).

MILLING MACHINE — *U S-Burke Machine Tool Div, Brotherton Rd, Cincinnati 27, Ohio.* This automatic machine was developed for the semiconductor industry, to slice and dice germanium, silicon, quartz, and other very hard metals to extremely close tolerances. The rotating arbor carries one or a gang of diamond impregnated disks—the only type of cutter which can be used on these materials (Apr 21, p266).

UNIVERSAL MILLER — *Graham Machine Tool Co, 19 Cleveland Pl, New York 12, NY.* Machine is equipped with a Pearson high speed reclinable vertical head with a hand- or power-operated quill with 5½ in. travel; rapid traverse in all directions; tapered roller bearings. The vertical head attachment allows operator to switch instantly from vertical to horizontal milling or vice versa without removing workpiece (Apr 21, p242).

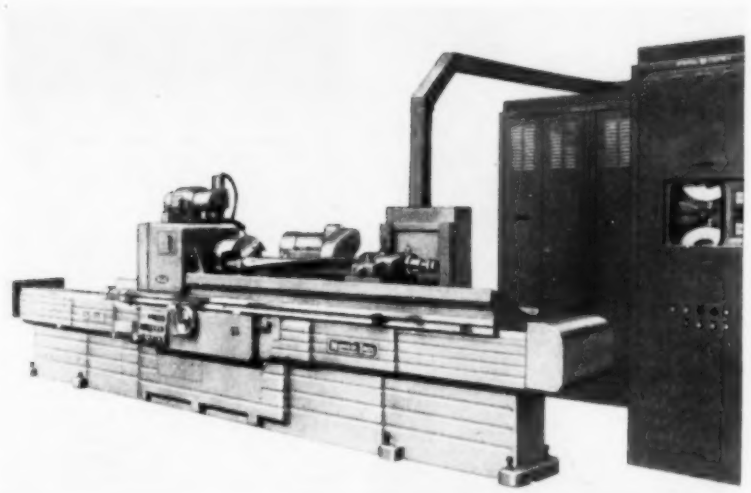
TOOLROOM MILLING MACHINE—*Mill All, 8 E Prospect Ave, Mount Vernon, NY.* Pantograph-controlled Mill All is designed to fill the gap between two-dimensional engraving machines and duplicating machines. It can be used for milling, machining, routing, drilling, spotfacing, grinding, slotting, lapping, indexed milling and engraving on all metals and plastics (Jun 2, p120).



DIE MILLING MACHINE—*Cincinnati Milling Machine Co, Cincinnati 9, Ohio.* Contourmaster 1C is equipped for three-dimensional, hand-guided, hydraulic tracer-controlled milling. The 3-D unit controls direction of traverse of table and saddle for 360° horizontal profiling, and vertical movement of spindle quill for vertical profiling. Other features include a 1-hp spindle drive motor, spindle quill travel of 3½ in., and eight speeds from 215 to 5650 rpm (Oct 6, p128).

GERMANIUM SLICER—*Reid Brothers Co, Beverly, Mass.* Machine is built around Reid's rugged 824 surface grinder with hydraulically operated table. Feeds as fine as 1/64 ipm can be obtained and cutting speed ranges from 1/64 ipm to 4 ipm. Max size of slug is 2 in. dia x 6 in. long. Machine will slice the germanium into the predetermined thicknesses and shut off when slug has been completely sliced (May 5, p154).

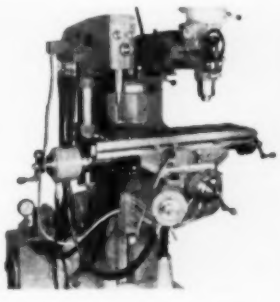
SPINDLE NOSE — *Cincinnati Milling Machine Co, Cincinnati 9, Ohio.* New type of spindle nose, designated Arbor-Loc, is now incorporated in 28 sizes, types and styles of Cincinnati knee-and-column milling machines having No. 50 series spindle nose. It provides a quick method of changing arbors. Dimensions and basic design of the standard spindle nose are retained (Feb 10, p152).



NUMERICALLY CONTROLLED 3-D PROFILERS — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Numeri-Trol machines perform numerically controlled three-dimensional milling around the axis of the work. Designed to produce such parts as cams, templets, and airfoil contours of steam turbine buckets and jet engine blades, the machines are also equipped for milling and grinding operations, and are said to be the first numerically controlled machines with grinding, dressing and dressing compensation (Sep 8, p127).

POWER QUILLS — *Precise Products Corp, Racine, Wis.* Three high-torque Super-Speed Power Quills, Models 55, 65 and 70, are designed for precision machining operations. Tools have speeds ranging from 35,000 to 45,000 rpm and motor ratings of 1/3, ½ and ¾ hp. They are self-contained with motor and drive designed as a single unit, free from vibration and chatter (Apr 21, p198).

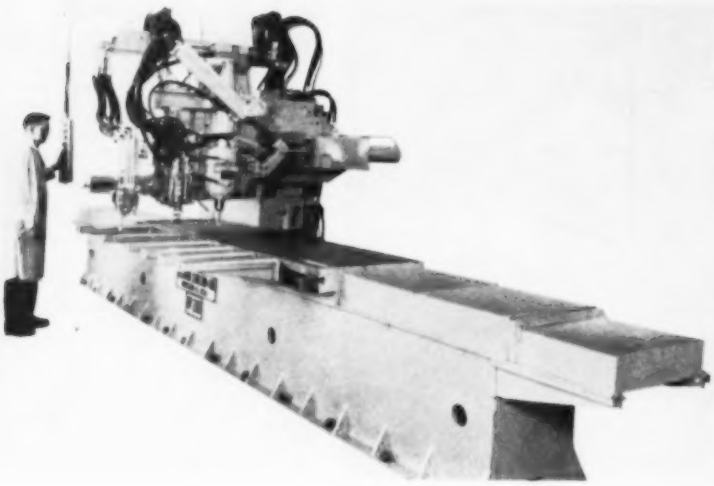
MILLING MACHINES — *Distributed by Stanley Sheppard, 30 Church St, New York 7, NY.* Adcock & Shipley Model 2JUR horizontal universal milling machine is equipped with a 5-hp motor drive, providing 24 spindle speeds from 30 to 1200 rpm and 15 rates of feed from ¾ to 30 ipm. A horizontal plain milling machine, Model 4HG, has 24 spindle speeds from 23 to 1250 rpm and infinitely adjustable feed changes (Apr 21, p195).

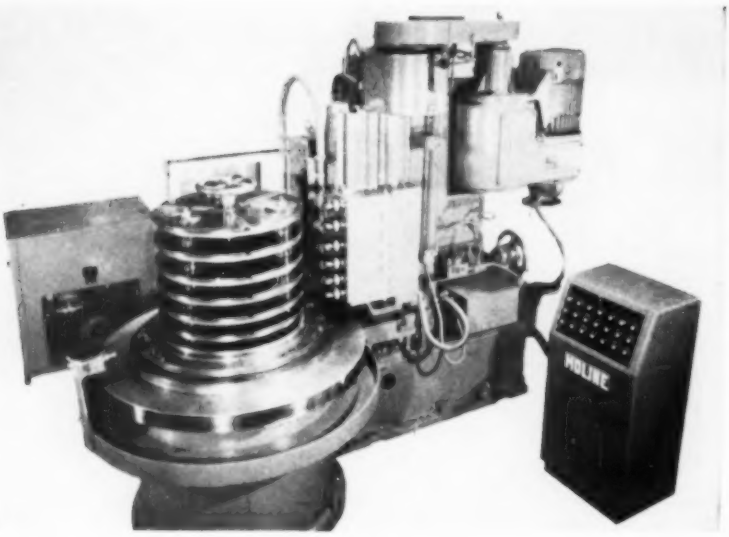


PROFILER — *Tool-Lab, Inc, 836 N Broadway, Escondido, Calif.* Pruitt Profiler P-500 incorporates a micro-feed guide button connected to micrometer dial permitting setting to 0.0005-in. accuracy. Routing, duplicating, and grinding of metals, plastics, wood, glass, or rubber become semi-automatic operations. Continuous speed adjustment from 100 to 45,000 rpm (Oct 20, p232).

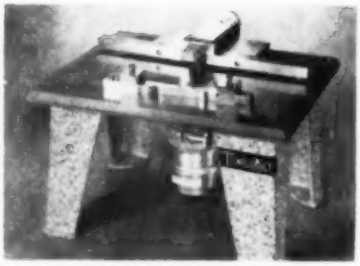
CROSS-SLIDE ROTARY TABLE — *Advance Products Corp, North Shore Drive, Benton Harbor, Mich.* Designed for multiple radius and angular milling with a vertical miller, table provides fast positioning of workpiece from one location to another. Over-all height of unit is 9¼ in. Other products include a 15-in. plain rotary table with 30 sec rotational accuracy and a milling machine T-square (Apr 21, p183).

HYDRAULIC DUPLICATING ATTACHMENT—*Waterborg Machine Co, 2830 Rapids Dr, Racine, Wis.* Scan-O-Matic can be installed on any standard mill. Tracing stylus automatically follows contour of master regardless of whether straight walls, angles, or curves are being cut. System does not reduce original range of machine. Cross feed is adjustable from 0.0025 to 0.150 in. Adjustable stop regulates depth of each consecutive cut (Nov 17, p248).





MILLING MACHINE — *Moline Tool Co, Moline, Ill.* Jet-engine compressor housings are machined on special, Model M43, 6-spindle milling machine. Six annular grooves and the tops of six ribs around outside surface of housings are milled. The housing is set down over the manual clamping fixture which supports and clamps housing from inside at six levels. Machine cycles automatically for both operations. Parts from 24 to 52 in. dia can be handled (Aug 25, p104).



TENSILE SPECIMEN MILLER — *Sicbury Industries, Inc. Horse Plain Rd. New Britain, Conn.* Tensilkut is designed for precision machining of tensile, fatigue and other physical test specimens. The increased horsepower of lates: model provides greater capacity with reduced machining time. Test specimens, from light 0.00025-in. foil or heavy 0.500-in. plate, can be precision machined from a wide range of metals including aluminum, stainless steel, copper, titanium, uranium, lead and superalloys (Jun 30, p110).

MILLING ATTACHMENT—*Alva Allen Industries, Clinton, Mo.* Model M attachment can be mounted on lathes, milling machines, turret lathes, planers, and boring mills, or can be supplied as original equipment on special machines. Attachment is suited for keyseating, milling, slotting, drilling, shaping, boring, spining and squaring. Spindle has No. 3 Morse taper and provides six speeds from 200 to 900 rpm. Capacity is a 1-in. end mill (Jun 2, p130).

PROFILE AND CONTOUR MILLER — *Ekstrom, Carlson & Co, Rockford, Ill.* No. 210 profile and contour milling machine, designed to machine ferrous and nonferrous materials, is tracer controlled in three dimensions, and can be equipped for twist milling. At present the machine is made in two sizes—24 in. wide with table travel of 4 ft, and 24 in. wide with a table travel of 10 ft. Infinitely adjustable spindle speed over the range of 50 to 6000 rpm is outstanding feature (Feb 10, p150).

MILLING MACHINE—*Cincinnati Milling Machine Co, Cincinnati 9, Ohio.* No. 1-D has a completely new spindle head. It is heavier than the 1-A and 1-B styles, and driven by a motor rated at 1½ hp (a 50% increase). Spindle is quill mounted, manual feed, with lever and fine handwheel feed controls. Power quill feed is available as extra equipment. Spindle speeds are infinitely adjustable from 100 to 3800 rpm (May 5, p148).

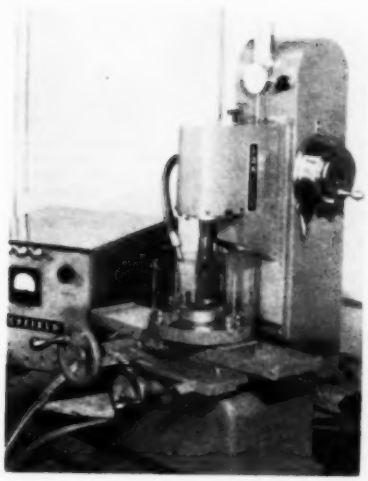
AUTOMATIC TRACING SYSTEM—*True-Trace Sales Corp, PO Box 3307, El Monte, Calif.* Synchro-Trace is adaptable to all makes of milling machines as a complete attachment for die sinking and mold making. System allows mill to be used as a conventional mill, with hand or power feed, or as a fully automatic die sinker. Pick feed on either cross or longitudinal feeds is infinitely variable from 0.002 to 0.250 (Dec 1, p144).

TEMPLET MILLING MACHINE — *Distributed by Cosa Corp, 405 Lexington Ave, New York 17, NY.* Designed to produce flat templets for profile grinding machines, copy lathes and copy milling machines, the foreign-made Studer SFM 500 operates on coordinate principle and is provided with optically-positioned longitudinal and transverse slides. Range of the optical syatem is 20 x 8 in. (May 5, p158).

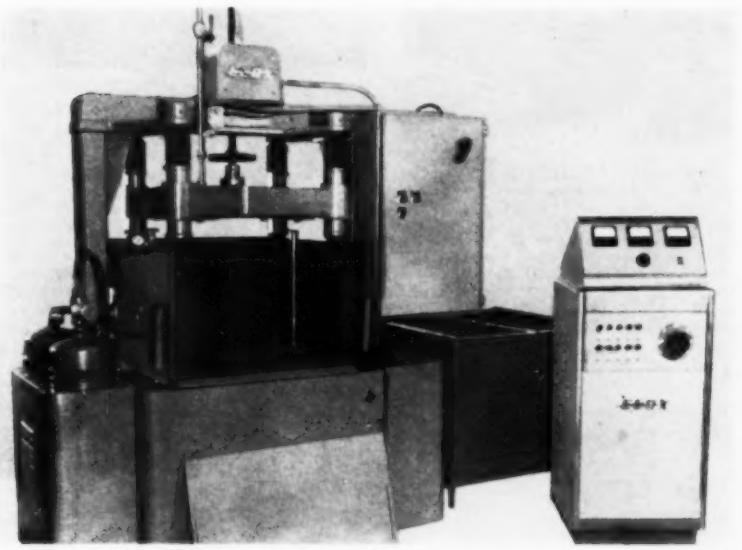
MILLING HEAD—*Challenge Machinery Co, Grand Haven, Mich.* Universal milling head permits vertical milling operations to be performed on a horizontal miller. Features of the head include a visual indicator of the depth of cut. The head is adaptable to any milling machine having a 3- to 5-in. dia overarm (Oct 20, p200).

American Machinist 1959 PRODUCTION PREVIEW

ELECTRICAL DISCHARGE, ULTRASONIC

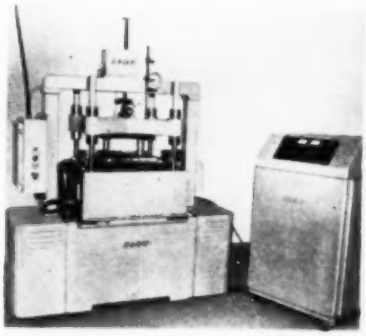


ULTRASONIC MACHINE — *Sheffield Corp, Dayton 1, Ohio.* Model 200-B2 machine tool has effective machining area to 1 in. when used for shallow drilling. Unit requires less than 2 x 4 ft of bench space, yet is capable of such operations as drilling, cutting, slicing, dicing, and the production of complex shapes and forms in germanium, ceramics, silicon, hardened steel and carbide (Oct 6, p128).



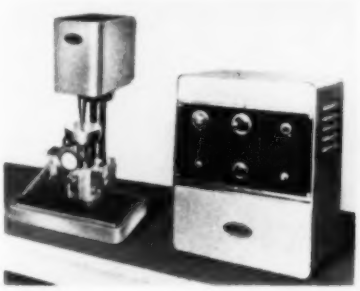
ULTRASONIC DRILL — *Distributed by International Electronics Corp, 81 Spring St, New York 12, NY.* Mullard Mark II 60-w unit operates at 20,000 vibrations a second. It can shape square and crescent as well as round holes, and any form required. It can also be used for cutting, slicing, and blanking. Surface finishes of 8 to 10 mu-in. are claimed; finer finishes can be obtained by using thinner abrasives (Mar 10, p189).

ELECTRO-CHEMICAL MACHINING — *Elox Corp of Michigan, 1830 N Stephenson Hwy, Royal Oak, Mich.* Electro-chemical machining process offers high metal removal rates on large scale die work. The process differs from electrical discharge machining in that a saline solution is used; the removal rates are higher; electrodes may be made of any conductive material; and the electrode wear is very low (Sep 22, p133).



ELECTRICAL DISCHARGE MACHINE — *Elox Corp of Mich, 1830 N Stephenson Hwy, Royal Oak 3, Mich.* Primarily designed to machine forging dies, the M-600 can be used to make dies of many types including blanking, extrusion, powdered metal, heading, draw, press trim, die casting, etc. It can also be used for special applications such as air foil shapes and intricate-shape holes, deep hole drilling and production runs of cavities or through-hole work in hard-to-machine metals (Apr 21, p197).

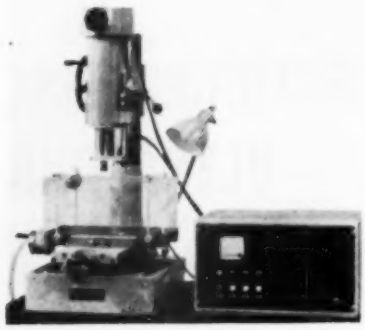
DISINTEGRATOR — *Jiffy Disintegrators, Inc, 1503 East 11 Mile Rd, Royal Oak, Mich.* Disintegrator head offers more controlled drive and lift power, permitting use of larger electrodes or deeper hole drilling. Sensitive vibration control is designed to allow use of very small diameter electrodes, 0.008 to 0.010 in. OD. Disintegrator will operate while completely submerged. Electrode consumption has been reduced (Sep 8, p132).



METAL DISINTEGRATING UNIT — *Cammann Mfg Co, Inc, 2700 Henninger Rd, Cleveland 9, Ohio.* Model C-66 electric arc disintegrator has its own pumping system and is used in conjunction with other shop equipment such as drillpresses. Its best application is in the removing of broken taps, reamers, studs, pins, etc. Machine provides an economical means of drilling curved and other shaped holes in very hard metals (Jun 30, p110).

ULTRASONIC IMPACT GRINDER — *Raytheon Mfg Co, Waltham 54, Mass.* Model 2-335 ultrasonic impact grinder uses a magnetostrictive transducer to permit a 100% duty cycle, yet is priced at less than $1000. Machine can cut, slice, drill, grind and trepan regular and irregular shapes in semi-conductors, ceramics, ferrites, carbides, metals, jewels and other hard or brittle materials (Dec 15, p135).

ULTRASONIC DRILL—*Gulton Industries, Inc, 212 Durham Ave, Metuchen, NJ.* The 100-w Glennite U-602 is designed for rapid drilling of intricate shapes into hard, brittle, and unyielding materials. Operating on a frequency of 20 to 22 kc, the high efficiency of the transducer and impedance matching system provides high cutting speeds with minimum of power (Jun 2, p124).



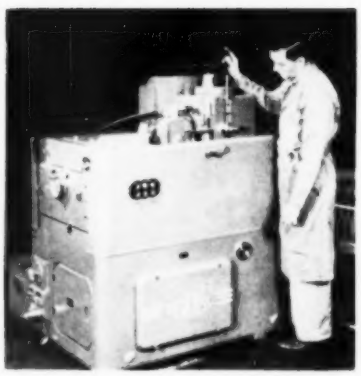
SPARK-EROSION MACHINES—*Distributed by Cosa Corp, 405 Lexington Ave, New York 17, NY.* Swiss-made Agietron spark-erosion machines offer reduced electrode consumption, high surface finish and high working accuracy. Model AA05 is designed for precision machining of the smallest dimensions. Maximum stock removal is 0.003 cu in. of steel per min, with a corresponding electrode wear of less than 20%. Specially equipped optical table has a movement of 6 in. in both directions and a reading accuracy of 0.00005 in. (Jul 14, p126).

DISINTEGRATOR — *Cammann Mfg Co, Inc, 2700 Henniger Rd, Cleveland 9, Ohio.* Model C-86 arc-drills shaped holes in hardened steels, titanium, stainless steels, Stellite, Inconel and other hard materials. Another valuable use is in the removal of broken taps, drills, reamers, setscrews, bearings, and hardened pins. Machine provides three 360° motions—the vertical column, head housing, and horizontal ram all swing 360° (Dec 15, p137).

GEAR CUTTING AND FINISHING

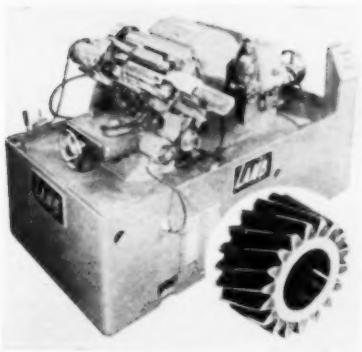
GEAR FINISHER—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Hardened small and medium-sized gears up to 12-in. dia can be finished to quiet-running smoothness by Model 999 Hard Gear Finisher which uses abrasive throwaway tool. The abrasive-impregnated plastic gear-shaped tool can be used for finishing spur and helical gears. The tool rotates in close contact with gear. Reciprocation of work table traverses part across tool for its full face width (Jul 14, p124).

GEAR SHAVING ACCESSORY—*National Broach & Machine Co, 5600 St Jean, Detroit 13, Mich.* Improved design of unit for handling cluster gears on rotary gear shaving machines enables it to handle four different gears on a single cluster. Loader is a rocker type in which an air cylinder powers a rocker arm mechanism that removes gears one at a time from an input magazine feed and deposits them in shaving location (Oct 6, p131).

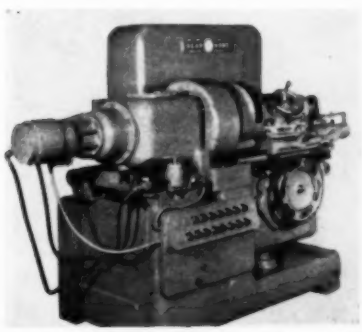


GEAR GRINDER — *Distributed by Sheffield Corp, Dayton 1, Ohio.* British-made Matrix No. 61 fine pitch gear grinder grinds from the solid by the Crushtrue process. The grinding wheel, similar to a large-diameter hob, or worm, has the basic rack form incorporated into its periphery. Specifications on the gears include: max pitch of 16 DP, minimum of 200 DP; diameter of work, 6 in. max; max length between centers, 9 in.; max length of teeth, 3 in. (Jul 28, p112).

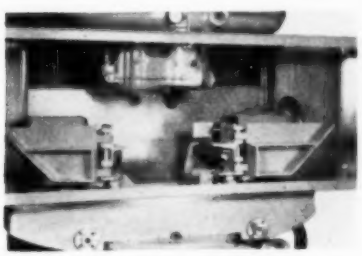
GEAR SHAPING CUTTERS — *Michigan Tool Co, 7171 E McNichols Rd, Detroit, Mich.* New cutter tips can be brazed to shank of worn blades of Shear-Speed gear shaping machines. After brazing, tools are ground to supply proper form and relief to cutting edge (Jun 16, p169).



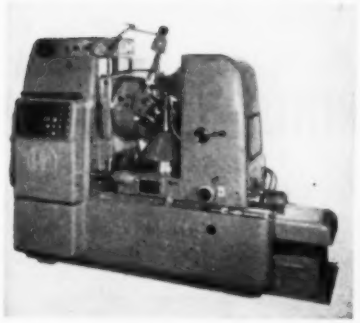
GEAR GRINDER — *F Jos Lamb Co, 5663 E Nine Mile Rd, Detroit 34, Mich.* Designed for production rates of 900 to 2100 gears per hr, this gear tooth chamfer grinder incorporates a unique method of parts handling and feeding. Machine operation is continuous and completely automatic. Changes in gear size or tooth configuration can be accommodated by minor fixture revisions and by changing the crush roll form dresser (Mar 24, p148).



GEAR TOOTH HONING UNIT — *National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Red Ring GHC performs both taper and crown honing on hardened gears from 4 to 6-in. PD. Abrasive-impregnated, gear-shaped, plastic honing tool, driven by work-gear, is mounted in crossed-axes relationship on a spindle head that is reciprocated by a slide during honing operation (Apr 21, p210).

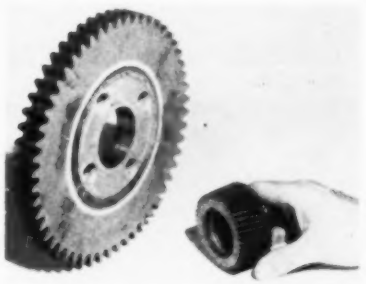


GEAR SHAVING ACCESSORY—*National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Roller-chain load rail simplifies loading of heavy gears in rotary gear shaving machines. Skidding of the gear shaft bearing or arbor surfaces, which occurs with slide rails, is reportedly eliminated. Chain rollers permit freedom of straight-line, back-and-forth movement (Jul 14, p122).



GEAR HOBBER — *Imported by Pfauter Machine Co, Inc, 35 Lawrence St, Yonkers, NY.* Model P-400, 16-in. high-speed gear hobber (German) is completely universal, equipped with a combination hob head which permits tangential hobbing of worm gears in addition to standard hobbing of spur and helical gears. Machine has 16-in.-dia table and speeds up to 500 rpm. Cycles are fully automatic (Apr 21, p199).

GEAR HOBBER — *Imported by Kurt Orban Co, 34 Exchange Pl, Jersey City 2, NJ.* Liebherr Model L 1800 gear hobber is powered by a 25-hp drive, with drive motor positioned just above hob slide. Machine handles gears up to 50-in. diameter. Standard machine is equipped for automatic cycling, and provides infinitely adjustable speeds and feeds. Automatic table, head and overarm clamping is standard (Apr 21, p183).

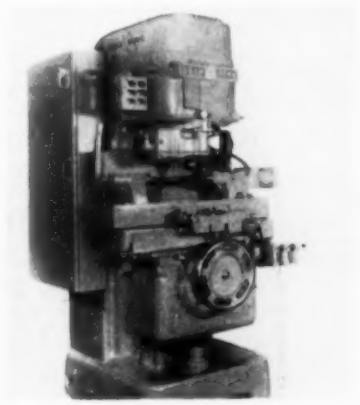


GEAR HONING TOOLS — *National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Red Ring gear tooth honing tools improve the sound characteristics of hardened gears by removing nicks and burrs, improving surface finish and making minor tooth shape corrections. These abrasive-impregnated, plastic gear-shaped tools come in a variety of pitches and diameters to hard-finish a wide variety of gears (Apr 21, p250).

AUTOMATIC GEAR LOADER — *Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* Designed for automated lines, this automatic loading and unloading device is available for all 870-series finishers. With gears automatically fed from a demand-type parts-distribution system, the device permits one operator to handle a battery of machines. Loading, shaving and unloading are all automatic (Feb 24, p152).

ELECTRONIC GEAR CUTTER — *Distributed by S & S Machinery Co, 140 53rd St, Brooklyn 32, NY.* Filmatic (Swiss) gear cutter and hobber produces small gears and pinions of standard and special tooth forms such as are used in meters, watches, cameras and precision instruments. It features constant automatic loading, automatic indexing and locking, and electronic preselection of cutter speeds up to 10,000 rpm (Apr 21, p193).

GEAR CHAMFERING — *National Broach & Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Red Ring process for producing profile-blended or straight chamfers on the tips of gear teeth can be applied to any spur or helical gear. Specially-designed tool mounts on spindle of conventional rotary gear shaving machine. Chamfering is performed by reciprocating and rotating the tool while feeding it to tight-mesh depth (Feb 24, p178).



GEAR HONING MACHINE—*National Broach and Machine Co, 5600 St Jean Ave, Detroit 13, Mich.* Improved Model GHB Red Ring machine provides both constant-pressure and zero-backlash methods for honing hardened gear teeth. Machine can be equipped for manual, semi-automatic or fully automatic loading. It is made in two sizes —one for gears up to 8-in. pitch dia, and one for gears up to 12-in. pitch dia (Jan 13, p158).

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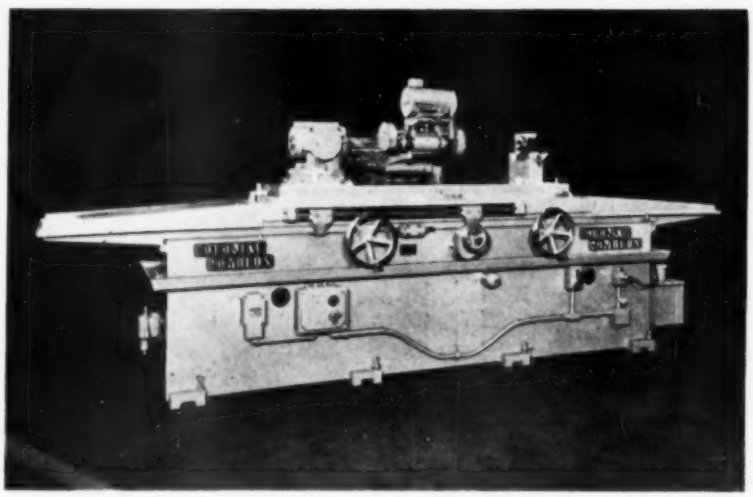
GRINDING, HONING, LAPPING

GRINDER — *Brown & Sharpe Mfg Co, Providence, RI.* Highly-instrumented Ceda/Size grinder can plunge grind suitable parts to any predetermined size within ±10 millionths; plunge grind parts to any predetermined fit in a group of mating holes within ± 20 millionths; and can perform fitting or finishing operations on a group of similar parts, removing as little as 10 millionths or up to 0.0002 in. from each piece within an accuracy of ± 10 millionths (Apr 7, p126).

PARALLEL-SURFACE GRINDER — *Imported by Mercuria Co, 3442 West 24 St, Chicago 23, Ill.* The Schulz-Hermsdorf Plane Parallel Grinder is designed to grind plane surfaces that must be perfectly parallel, such as the contact faces of gap gages. For inside faces, machine uses grinding wheels of 7 to 9¼ in. dia. For outside surfaces, cup shaped wheels are used. The latest version has a fully automatic grinding cycle. All models provide continuous indication of size as grinding progresses (Apr 21, p259).

CONVEYORIZED GRINDER—*Engelberg Huller Co, 831 W Fayette St, Syracuse 4, NY.* Designed for high-volume flat surfacing of ferrous and nonferrous metals, glass, plastics, ceramics, and other materials, Model 680-6 is equipped with six individually adjustable grinding heads. Unit has max piece capacity of 5 in. high, 5½ in. wide, and length. Conveyor belt speed is adjustable from 2 to 25 fpm. Model is designed for both wet and dry-belt grinding (May 19, p154).

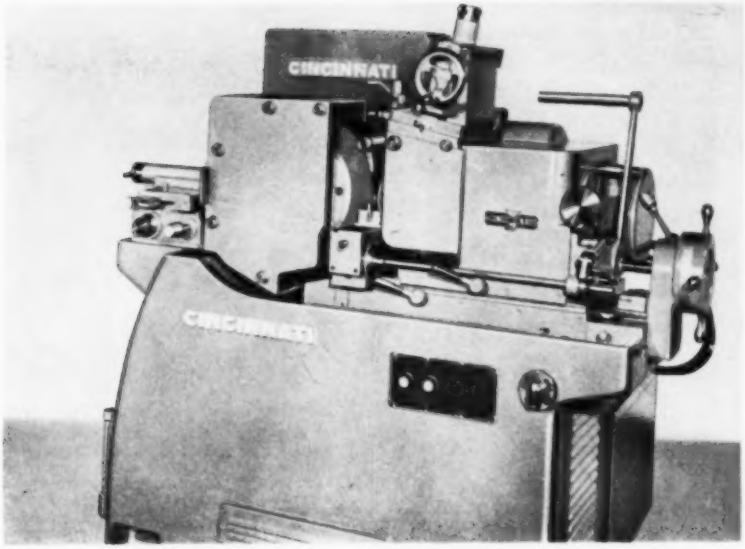


TOOL AND CUTTER GRINDER — *Colonial Broach and Machine Co, Colonial-Romulus Div, Parkgrove Station, Detroit 5, Mich.* Machine has 42-in. length of grind and is capable of handling cutter assemblies weighing up to 1000 lb. It can grind either HSS or carbide-insert milling cutters. Straight and helical flutes on outside diameters, radial faces and end faces can be ground. The OD's can be cylindrical, tapered or contoured (May 5, p149).

GRINDER — *Hammond Machinery Builders, Inc, 1618 Douglas Ave, Kalamazoo, Mich.* Model ND-12 No-Dust grinder with the U-2 abrasive belt attachment offers a versatile grinder-polisher combination. The attachment takes belts from 72 to 90 in. long and 1 to 2½ in. wide. Other attachments make it possible to do platen and contour grinding. A 12-in.-dia rubber contact wheel gives a surface speed on the belt of 5500 sfpm (Apr 21, p273).

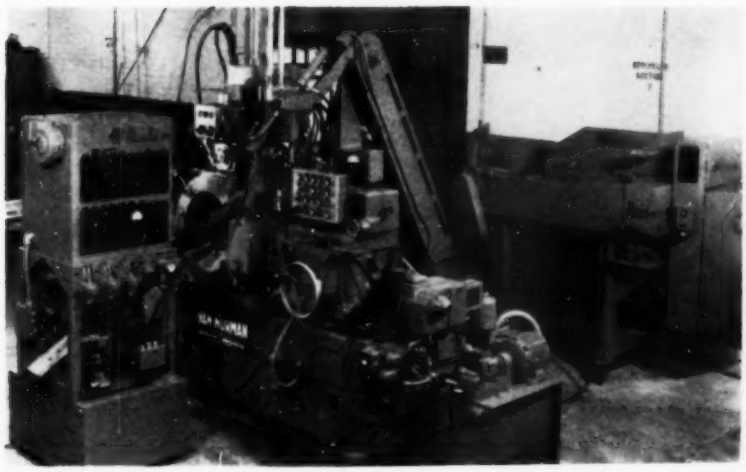
TOOL GRINDING ATTACHMENT— *Detroit Reamer & Tool Co, 780 W Maple Rd, PO Box 174, Birmingham, Mich.* Circularity grinding attachment for grinding or reworking of cutting tools provides simple, fast setups for quick, easy grinding of form relief; radial relief; both together; tapered cylindrical and straight cylindrical (Jun 16, p170).

WAY GRINDER — *Thompson Grinder Co, Springfield, Ohio.* Hydrail type grinder, with a work area of 48 x 36 x 240 in., is designed for grinding the ways of large machine tools. Horizontal and vertical wheel heads are independently operated. Horizontal head makes a 24 x 3 x 5-in. wheel and operates at 1800 or 3600 rpm (Mar 10, p162).



CENTERLESS GRINDER — *Cincinnati Grinders Inc, Cincinnati 9, Ohio.* Filmatic No. 1 centerless grinder is a small, general-purpose grinder suitable for grinding metallic or non-metallic parts up to 1½ in. in diameter. Machine is recommended for rapid production of small drills, pins, punches, shafts and instrument parts. Machine handles infeed and thru-feed operations equally well, and can be equipped for unusual setups or continuously automatic operation (Mar 24, p143).

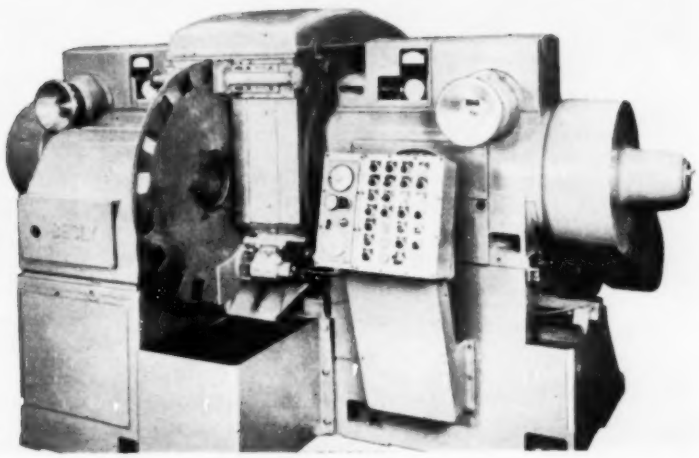
HYDRAULIC SURFACE GRINDER—*Graham Machine Tool Co, 19 Cleveland Pl, New York 12, NY.* Astra Type H-24 features special wheel balancer and adjustment on the wheel mounts. These devices allow operator to adjust work for maximum accuracy and highest finish. Other features include hydraulic power feeds for table and in head, rapid traverse, mist coolant system, and a built-in diamond wheel dresser (Apr 21, p240).



GRINDER FEED—*Abrasive Machine Tool Co, East Providence, RI.* Power feed to the table is available on company's 18-in. face grinder. A hydraulic power system with a 2-hp 1200-rpm motor provides equivalent of 50-lb push at the handwheel, which amounts to 600 lb at table. Max cutting speed is 24 fpm; return is 42 fpm. Power unit is interlocked with table handwheel (Jan 13, p168).

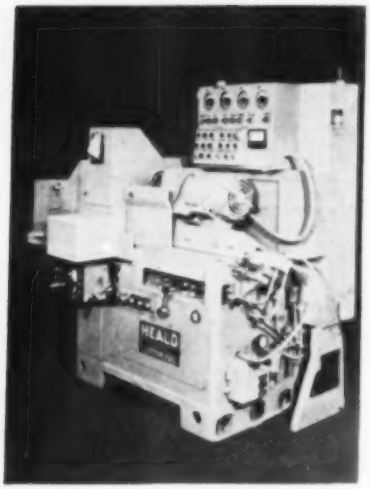
CENTERLESS GRINDER—*Van Norman Machine Co, Springfield, Mass.* Van Norman 2C centerless grinder has been equipped with an automatic loader and an automatic gaging system. So equipped, it loads, orients, grinds and gages 250 universal crosses per hour for a major automotive concern. Finish obtained is 15 RMS or better, and a conservative figure is 1200 pieces per dress (Dec 1, p139).

GRINDER CYCLING—*Abrasive Machine Tool Co, Dexter Rd, East Providence, RI.* Flats, slots, shoulders and shapes can now be ground automatically to close tolerances on hydraulically powered Hydrabrasive precision surface grinders. By setting the automatic down-feed to actuate either on the table reversal or saddle reversal, the equipment will operate to preset tolerances (Jun 16, p136).

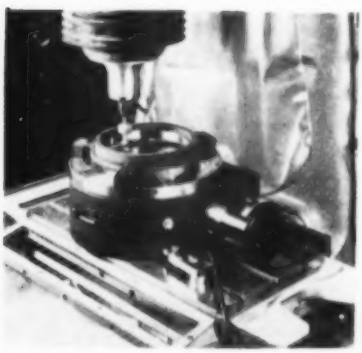


GRINDERS — *Olivetti Corp of America, Machine Tool Div, 42-33 Northern Blvd, Long Island City 1, NY.* Series R4 semi-automatic cylindrical grinders feature plunge infeed as standard equipment (Apr 21, p181).

DISK GRINDER—*Besly-Welles Corp, 120 Dearborn Ave, South Beloit, Ill.* The DH4 double horizontal-spindle disk grinder makes disk grinding virtually automatic. Simplified pushbutton operation, accuracy to tenths, simple three-step abrasive changing, automatic dressing and sizing, centralized one-shot lubrication, and an improved, through-the-spindles coolant system are among the features of this machine (Dec 15, p132).



INTERNAL GRINDERS—*Heald Machine Co, Worcester 6, Mass.* Both of these internal grinders feature Rite Angle design in which table is inclined at 30° to the work. The inclined table prevents table from lifting when work is fed into wheel. The Model 180A roll-type centerless machine is designed for small to medium size work that can be rotated on its own OD. Model 170A automatic chucking internal grinder handles work of about the same size (Oct 20, p205).



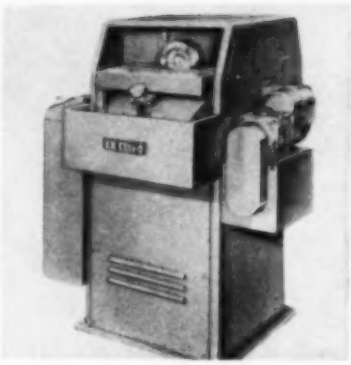
ROTARY GRINDING FIXTURE — *M-M Tool Mfg Co, Roto-Grind Dept, 1124 E Third St, Dayton 2, Ohio.* Roto-Grind is reported to double the capacity of a toolroom grinder. Suited for external and internal grinding, unit is essentially a motorized table that turns under the grinding wheel of any surface grinder or jig grinder. Fixture is 10⅜ in. diameter and 5¾ in. high. The top plate is hardened steel (Jul 28, p108).

SURFACE GRINDER — *Norton Co, Worcester, Mass.* This 6x18-in. Type S-3 hydraulic surface grinder is reported to reduce grinding time by as much as 50% through the action of its high speed table. The maximum table traverse speed of 125 fpm also reduces burn, checking and cracking of the work. The machine can grind workpieces as high as 15 in. above the work-table with a standard 8-in.-dia grinding wheel (Sep 8, p128).

BRAKE SHOE GRINDER — *Barrett Equipment Co, 2101 Cass Ave, St Louis 6, Mo.* Model B-75B Radius Grinder is now being preset at the factory to automatically undersize grind brake shoes to properly fit the brake drums in which they are to operate. Operator simply measures the drum diameter, sets the grinder for this diameter, and grinds the shoes (Jun 16, p154).

ELECTROLYTIC GRINDING SPINDLES—*Standard Electrical Tool Co, 2588 River Rd, Cincinnati 4, Ohio.* Motorized or independently driven units are now available to handle 1000 amps. The spindle nose will serve a variety of wheel holders for straight or recessed wheels. Other models available for 75, 100 and 350 amps (Jun 16, p144).

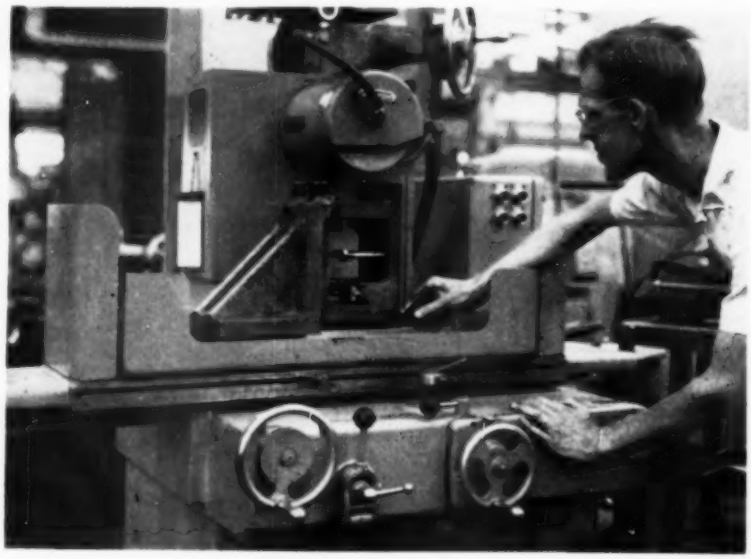
OSCILLATING GRINDER — *Hammond Machinery Builders, Inc, 1618 Douglas Ave, Kalamazoo, Mich.* Model SCE-10 Duplex Oscillator permits operator to grind two carbide tools at same time, with less effort and in less time than is required to partially grind one tool by conventional methods. Stroke length is adjustable from 0 to 1½ in., for up to 2-in. tools. Stroke frequency is adjustable from 0 to 115 spm. Machine can be equipped for electrolytic grinding (Apr 21, p180).

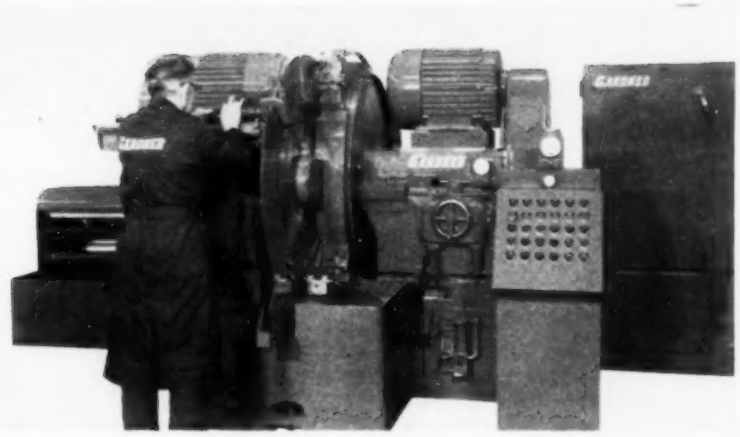


RECIPROCATING TOOL GRINDERS — *Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Grinders are of the double-end reciprocating type. Style 142 is for conventional grinding with vitrified or diamond wheels; Style 264 has metal-bonded diamond wheels for electrolytic grinding. Machines perform conventional grinding at one end and chipbreaker grinding at the other. Features include a variable stroke of 0 to 1½ in; variable reciprocation of 0 to 220 strokes per min (Jan 13, p156).

CUTOFF WHEEL GRINDER — *Continental Machine Co, 2345 W Nelson St, Chicago 8, Ill.* Bench-model grinder sharpens 4½ to 8-in. pipe and tube rotary cutoff wheels. Manual bevel adjustment and setscrew stop permit exactly equal length bevels on both sides of blade. Price, $290 fob plant (May 5, p150).

DRILL GRINDING MACHINE—*Cawi Machine Co, 34 Exchange Pl, Jersey City 2, NJ.* Cawi-Spiral Model N-4-90-Z grinds drills or similar tools in sizes from 1/32 in. up to 27 in. diameter. The drill point does not depend on the shape of the grinding wheel; the angle may be varied by adjusting the planetary gear head to the desired angle within the range of −10 to +180° (Apr 21, p258).





DISK GRINDER — *Gardner Machine Co, Beloit, Wis.* Model 2H40L double horizontal-spindle disk grinder is available with 36- or 42-in.-dia abrasive disks. It can handle parts up to 18 in. in diameter. This particular machine is equipped to grind two parallel sides of valve plates (Dec 29, p78).

ELECTROLYTIC POWER UNIT — *Anocut Engineering Co, 631 W Washington Blvd, Chicago 6, Ill.* Electronic electrolytic power supply unit with output capacity of 1000 amps is designed for large volume work such as surface and cylindrical grinding where wheels from one to three inches wide are used and there is large contact area between wheel and work. Unit acts as both the power and control source for electrolytic grinding (Apr 7, p127).

GRINDING HEAD—*Threadwell Tap & Die Co, Greenfield, Mass.* Radial feed of air turbine grinding head can be adjusted without stopping machine. The Grind-A-Matic can be mounted on a jig borer, boring mill, lathe, milling machine, drillpress or other comparable machine tool. Fine radial adjustments can be made over a range from 0 to 0.70 in. dia by means of graduated collar. Coarse adjustment from 0 through $1\frac{1}{4}$-in. grinding radius is made while spindle is stationary (Aug 11, p122).

CARBIDE-INSERT GRINDER—*Harvill Machine Co, 618 East 10 Mile Rd, Hazel Park, Mich.* Machine will grind entire periphery of the throwaway, including the radius, in one operation. Radius is ground perfectly tangent with the sides; sides are flat and parallel within 0.0002. Unit will grind any shape of tool, including squares, triangles, pentagons, diamond, rounds; any radius from 0.010 up; negative and positive rake tools (Aug 11, p136).

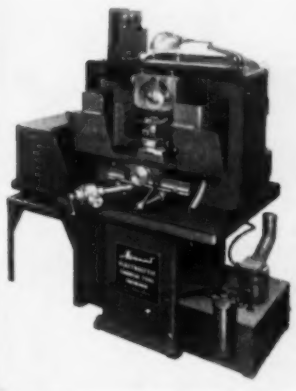
HYDRAULIC KNIFE GRINDER — *Abrasive Machine Tool Co, Dexter Rd, East Providence, RI.* Unit is capable of grinding 1500 knife blades, 8 in. long, in eight hours. Equipped with an 8 x 47-in. table, swivel head, automatic rapid traverse between stations, and a 3-hp 1160-rpm motorized spindle, unit can also be used for flat and hollow grinding of parts in volume production (Mar 10, p164).

3-D CONTOUR GRINDER — *Bullard Co, 286 Canfield Ave, Bridgeport 2, Conn.* Vertical chucking grinder is available with capacities from 26 to 76 in. and in any desired height. Heads from 3 to 10 hp provide speeds of 5000 sfpm or more. Double-dimension contour control device controls both horizontal and vertical motions of head. A single-dimension device maintains grinding wheel tangent to any irregular surface being ground (Apr 7, p129).

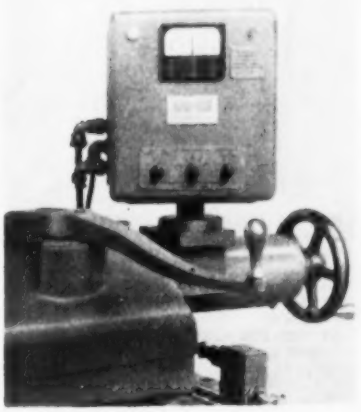
HAND SURFACE GRINDER—*DoAll Co, Des Plaines, Ill.* Model DH-612 has been engineered for utmost in operator convenience. The 6-in. adjustment permits best height to be selected for every operator, in either standing or sitting positions. The unique position of downfeed handwheel, 12 in. out from column, places it at eye level, eliminates stretching to reach it. Each revolution of handwheel equals 0.025 in. feed (Sep 22, p138).

AUTOMATIC ROTOR GRINDER—*Engleberg, Inc, 831 W Fayette St, Syracuse, NY.* Model BG8 HT is an abrasive belt machine designed to grind rotors to diameter tolerance of ± 0.001 in. and concentricity tolerances within 0.0005 in. Machine handles rotors from one to $4\frac{1}{2}$ in. dia. Rotors of $3\frac{3}{8}$ in. OD, with 2-in. stack, are ground at the rate of 180 per hr (Dec 1, p138).

AUTOMATIC GRINDER CONTROL —*Radio Corp of America, Front & Cooper Sts, Camden, NJ.* Designed for grinding operations on a wide variety of small magnets, this system positions and feeds the slugs to the grinder, and gages the finished magnets. Pieces out of tolerance are rejected automatically. Gaging units are the direct-contact type; air gaging units are also available. Control can hold tolerances of 0.00005 in. (Dec 15, p131).



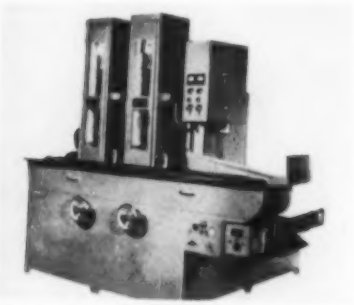
TOOL GRINDER—*Hammond Machinery Builders, Inc, 1618 Douglas Ave, Kalamazoo, Mich.* Model CBE-66 chipbreaker and oscillating cup-wheel grinder combines the company's CBE-6 and SCE-6 grinders into one machine. The spindle on the chipbreaker end is equipped with a power pickup for electrolytic grinding. On the cup wheel end, the effort and fatigue of manual tool oscillation is eliminated by an oscillating spindle (Jun 16, p126).



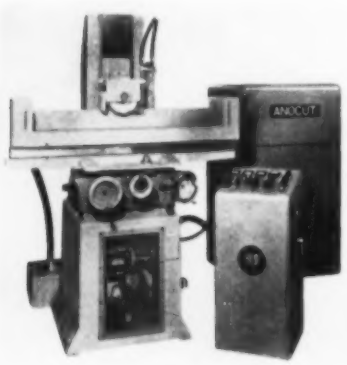
TAPER CORRECTING ATTACHMENT — *Cincinnati Milling Machine Co, Grinding Machine Div, Cincinnati 9, Ohio.* Gage-Line attachment is an electronic device that provides precise alignment of the swivel table, thereby eliminating uncertain "cut-and-try" techniques when grinding work to precise straightness. Gage-Line is applicable to the company's Filmatic center-type grinders up to 48-in. length, plain grinders from 4 to 14 in., and all sizes of their universal grinders (Dec 15, p136).

GRINDING, HONING, LAPPING

DRILL GRINDERS — *Alina Corp, 122 E Second St, Mineola, LI, NY.* Line of drill grinders is designed to grind twist drills, step drills, spotfacing cutters, keyway milling cutters, end mills, screw taps and reamers. The three models have ranges from 0.080 to 1.250 in. (Apr 21, p253).

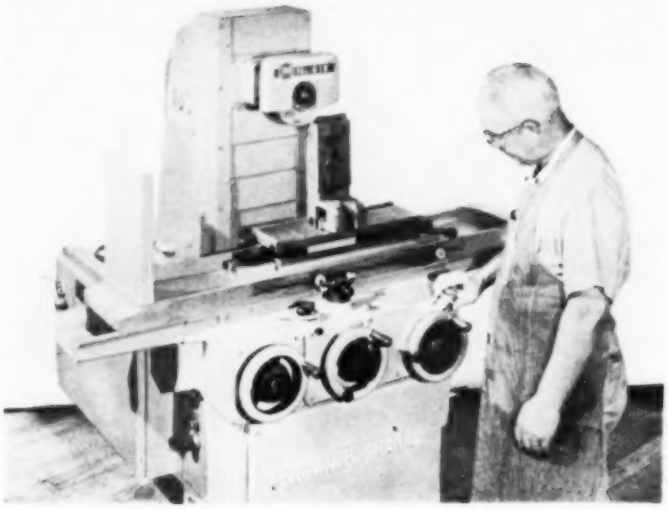


MULTIPLE-HEAD BELT GRINDER —*Engelberg, Inc, 831 W Fayette St, Syracuse 4, NY.* Model 696 multiple-head abrasive belt grinder permits high speed grinding and finishing operations. Unmachined surfaces, ground on a series of progressively finer-grit belts, can be finished in one pass. Heavy stock removal can be accomplished by using a series of identical belts. Machine is available with from two to six or more individually adjustable heads (Jul 11, p119).



ELECTROLYTIC GRINDER — *Reid Bros Co, Inc, Beverly, Mass.* Model 618 electrolytic grinder is designed for grinding and stock removal of carbides, hardened steels, and the grinding of parts unsuited to normal grinding procedures. The machine uses basic Anocut 300-amp unit as its electrolytic power supply. Table speeds range from ½ to 11 ipm (Mar 10, p159).

ROTARY SURFACE GRINDER — *Heald Machine Co, Worcester 6, Mass.* Model 161 grinds flat, convex or concave surfaces of work up to 6 in. OD. The column-type machine, which produces finishes of 2 to 4 mu-in., accommodates a wide range of relatively small work such as saw blades, slitters, and gear cutters. Machine has a 10-in. vertical capacity to center of wheel, 4-in. grinding stroke and 12½-in. swing inside the guard. It is made for wet grinding operations (Feb. 24 p151).

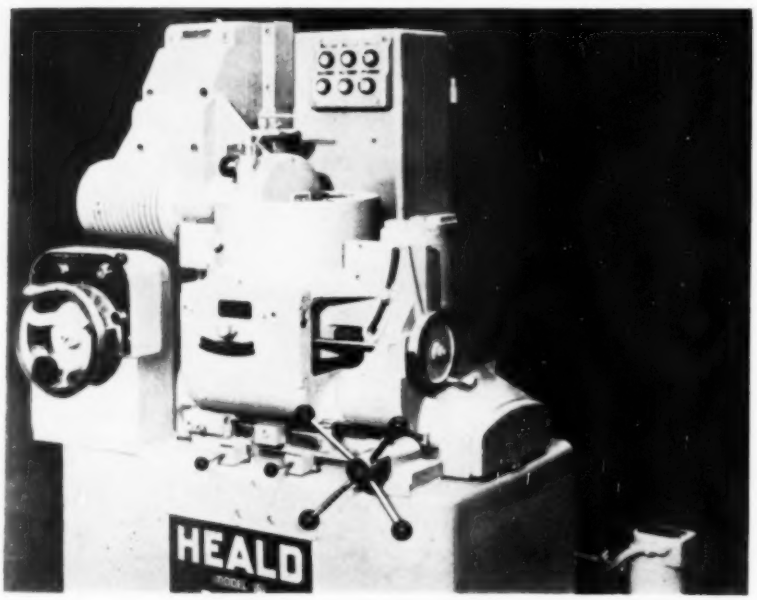


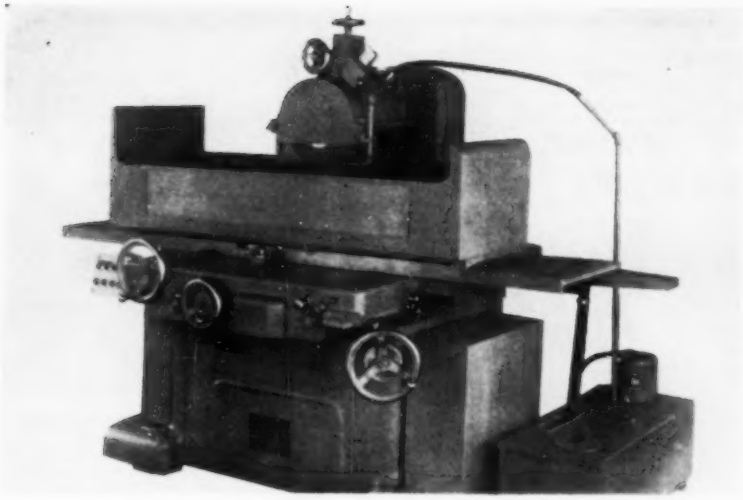
SURFACE GRINDER — *Brown & Sharpe Mfg Co, Providence 1, RI.* 618 Micromaster surface grinder is designed for rapid, highly accurate surface grinding of small and medium-sized workpieces. Hydraulic longitudinal feed of the table is adjustable from five to 100 fpm for the full travel of 22 in. Cross feed is adjustable from 0.01 to 0.25 in. (Dec 1, p140).

ROLL GRINDING ATTACHMENT — *Carborundum Co, Coated Abrasives and Curtis Machine Divisions, Box 477, Dept RG, Niagara Falls, NY.* Curtis RG-2 attachment uses an abrasive belt to grind metallic and rubber rolls while producing accuracy and finishes equal to those obtained by traditional methods of roll grinding. Tests show 50-80% time savings while maintaining exacting tolerances for either special, straight or crowned rolls (Mar 10, p168).

TILTING GRINDER SPINDLE—*Mattison Machine Works, Rockford, Ill.* Quick-tilting device for creating wheel clearance on vertical-spindle rotary surface grinders makes it possible to convert from rough to finish grinding in seconds so that both high stock removal and flat grinding can be accomplished on every job. Spindle is available as optional equipment on all Mattison No. 24 and 36 models (Dec 1, p149).

SAW BLADE GRINDER — *Cawi Machine Co, Inc, 3¼ Exchange Pl, Jersey City 2, NJ.* The foreign-made Tempo saw blade grinding machine grinds large circular saw blades with solid or inserted teeth. Machine can be adjusted to grind straight or curved teeth. High and low teeth are produced automatically in one operation. Spindle can be adjusted to chamfer the teeth (Apr 21, p236).

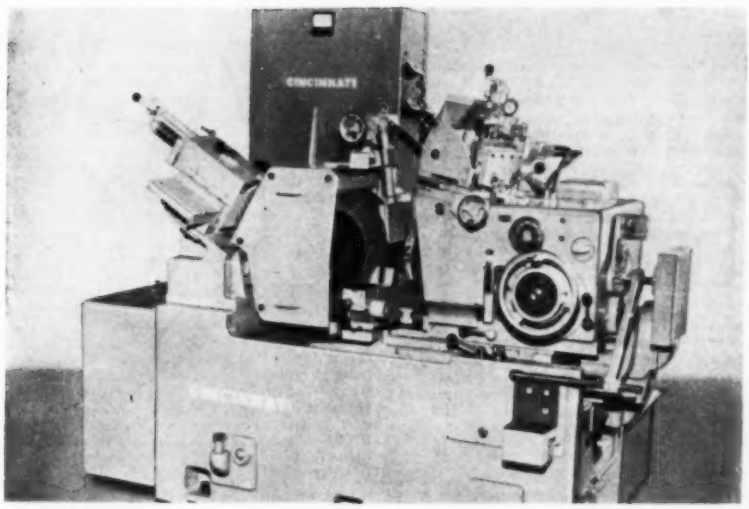


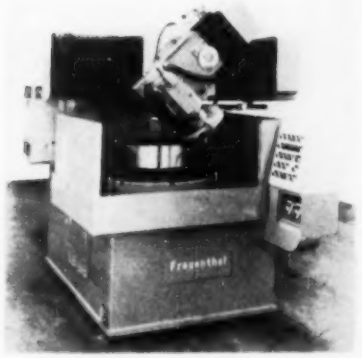


HYDRAULIC SURFACE GRINDER—*Covel Mfg Co, Benton Harbor, Mich.* No. 80 will grind work 6 x 36 x 18½ in. high under a 14-in. wheel. Sealed hydraulic oil tank is mounted outside at right end of machine. Table speeds are 10 to 90 fpm. Adjustable hydraulic cross feed for table is from 0.005 to 0.300 in. at each reverse of table (Mar 10, p158).

SHEAVE GRINDER — *Grinding & Polishing Machinery Corp, 2530 Winthrop Ave, Indianapolis 5, Ind.* Sheave grinder grinds both the throat and OD of sheaves from 10 to 42 in. in diameter. A formed contact wheel grinds the groove; the work is then moved under the flat-faced contact wheel to grind to OD. Interchangeable wheels and extra adapters accommodate various sizes of sheaves (Jul 14, p120).

GRINDING FIXTURE ATTACHMENT—*Harig Mfg Corp, 5757 W Howard St, Chicago 31, Ill.* Attachment locates and clamps ball-seat punches in the Harig Grind-All fixture. Nib accurately locates punch in the same relationship as it will be in the punch holder. Hardened and ground unit is available with ¼, 5/16, ⅜, and ½-in. nibs to fit these respective ball-seat sizes (Dec 15, p137).





CENTERLESS GRINDERS — *Cincinnati Grinders Inc, Cincinnati 9, Ohio.* Two Cincinnati centerless grinders, the 15-hp No. 2 and the 25-hp No. 3, have been improved to offer reduced setup time and to broaden the range of application. Grinding wheel truing controls are located for improved convenience of operation. The bed is 5 in. longer. Greater throat capacity accommodates larger regulating wheels (Jun 2, p119).

TOOL GRINDER — *United Tool Co, 303 U B Bldg, Huntington, Ind.* Automatic tool grinder will duplicate a given form on single point brazed or solid-carbide cutting tools. Known as Contour-O-Matic, it will both rough and finish grind in same setup, using same grinding wheel. Machine has duplicate fixtures for holding tool to be ground and a master templet or master form tool (Apr 21, p197).

VERTICAL GRINDER — *Frauenthal Div, Kaydon Engineering Corp, Muskegon, Mich.* The 1200 Series single-spindle vertical grinding machine is a fixed rail design and is available in two sizes and two models. 1224 size has a 24-in.-dia table with 36-in.-max swing capacity. 1236/42 has a 36-in. or 42-in.-dia table with 48-in.-max swing capacity. Compound swivels 45° either side of center; grinding spindle, in turn, swivels 90° either side of slide center (Nov 17, p238).

UNIVERSAL GRINDER — *Imported by Sigma Machinery Inc, Two Park Ave, New York 16, NY.* Hydraulic universal grinder, 1U, (Czechoslovakia) has 10-in. swing, 15-in. centers. Machine does internal and face grinding, and is designed for toolroom and limited production operations. It has a 12 x 1¼-in. wheel and can be supplied with a full line of attachments (Oct 20, p212).

GRINDING AND LAPPING MACHINE—*Wickman Mfg Co, 10325 Capital Ave, Oak Park, Mich.* Bench Model GF-O is designed for lapping of both RH and LH tungsten-carbide tools. Because of oscillating motion of the head, operator needs only to hold the tool firmly on the table and press lightly on the cutting face of the diamond wheel to produce a perfectly straight edge at whatever rake is required (Nov 3, p144).

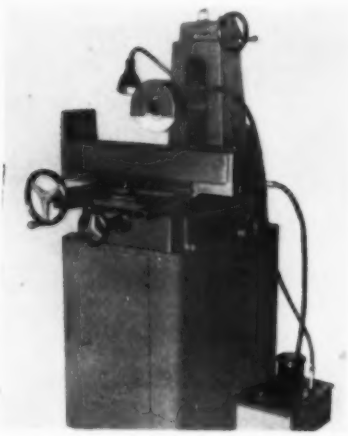
GRINDING ATTACHMENT — *Gebhart Machine Tools, Ltd, 1608 Victory Blvd, Glendale, Calif.* Cylindrical OD grinding attachment, in addition to using true dead centers which assure concentricity to 0.0001 TIR, can also serve as an inspection instrument. Features include built-in sine plate and micrometer; spring loaded tailstock centers; 24-division index plate (June 16, p150).

SWIVEL TABLE GAGE — *Landis Tool Co, Waynesboro, Penna.* Device called Micro-Swivel is designed for quick and accurate setting of the swivel table on new Landis precision cylindrical grinders. It is an amplification unit that greatly magnifies table movements which are registered on a large easily read gage (Feb 24, p148).

GRINDING ATTACHMENT—*Onsrud Machine Works, Inc. Machine Tool Div, Niles 31, Ill.* Air turbine grinder, designated DIALH, is available with left-hand rotation for mounting on milling machines and machine grinders. Typical applications of this high-speed (50,000 rpm) tool include slot and depth grinding, tool chipbreaker grinding and cutter sharpening. Its ¼ hp is ample for grinding wheels up to ½ in. dia (May 19, p150).

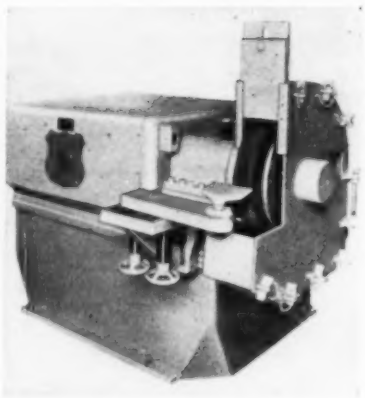
GENERAL-PURPOSE GRINDER — *U S Electrical Tool Co, 3640 Llewellyn St, Cincinnati 23, Ohio.* Redesigned to include a dust collector in its base, Model 500 grinder is available in 1, 2 and 3-hp models. Grinder features a totally enclosed motor, pushbutton starter, wheel guards, tool tray, and water pot. Unit is rated at 1000 cfm at 4 in. pressure. Machine is 32½ in. wide and 20 in. deep (Mar 19, p159).

ELECTROLYTIC GRINDER — *Anocut Engineering Co, 631 West Washington Blvd, Chicago 6, Ill.* CME-6 machine, built by Hammond Machinery Builders, Kalamazoo, Mich, grinds both chipbreakers and cup wheels. Anocut 150-amp electrolytic power supply is located at base of machine. Chipbreaker end is equipped with a vise for tools up to 2½ in. wide. Cup wheel end has 8½ x 14½-in. table with a compound protractor (Mar 10, p158).



SURFACE GRINDER — *Harvey Mfg Corp, 408 St Paul St, Rochester 3, NY.* Model LG-812 is designed to handle large, fine tolerance grindings as well as very small intricate work. Max capacity of this hand-feed model is 9 x 13 x 11½ in. Machine is also available with hydraulically operated longitudinal table travel (Apr 21, p210).

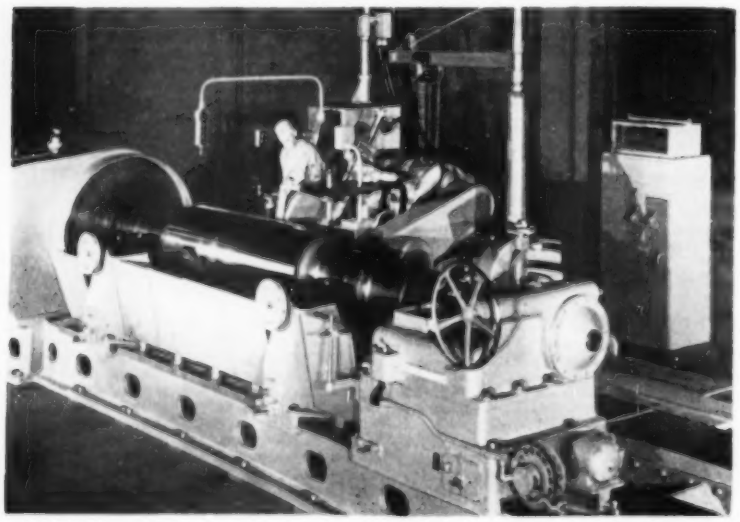
GRINDING SPINDLES — *Standard Electrical Tool Co, 2488 River Rd, Cincinnati 4, Ohio.* Spindles are available in sizes ranging from a ½-hp unit with a 6-in. grinding wheel to the 20-hp model with a 24-in. wheel. Wheel spindle can be adjusted vertically (Nov 3, p132).



SNAGGING GRINDER—*United States Electrical Tool Co, Llewellyn St, Cincinnati 23, Ohio.* Model 61HVS snagging grinder does away with gears, belts and adjustable pulley drives. The hydraulic drive is operated by a TEFC motor working a hydraulic pump. This system provides constant horsepower, constant peripheral speed and automatic wheel wear adjustment (Sep 8, p136).

CYLINDRICAL GRINDER — *Distributed by Eric E Bachmann Co, Inc, 27-11 41st Ave, Long Island City 1, NY.* Cresta 512 (German) universal cylindrical grinder features a swing of 10 in. and is supplied with 20, 30, or 40 in. between centers. Machine is capable of plunge-cut grinding. It is hydraulically controlled and can be equipped with a swivelling internal spindle, as well as with a series of measuring instruments (Apr 21, p184).

AUTOMATIC SURFACE GRINDER—*Blanchard Machine Co, 64 State St, Cambridge, Mass.* Blanchard 80-A3, center-column design, has three grinding wheel spindles. Each wheel is maintained at correct height by a new finger-type feed control caliper. Plain table is 48 in. ID x 80 in. OD. Wheels are 18-in. cylinder or 22-in. segment. Feed is manual or power; rapid raising or lowering of wheelheads is by power (Dec 15, p134).



HONING MACHINE—*Superior Hone Corp, 1607 Elreno St, Elkhart, Ind.* Model AM honing machine is designed for production runs, toolroom work and salvage operations. It measures 48 in. high, 28 in. wide and 36 in. deep. Spindle speeds are adjustable from 250 to 1100 rpm. The drive, the 14-gal removable coolant tank and the 1½-hp motor are completely enclosed (Aug 25, p108).

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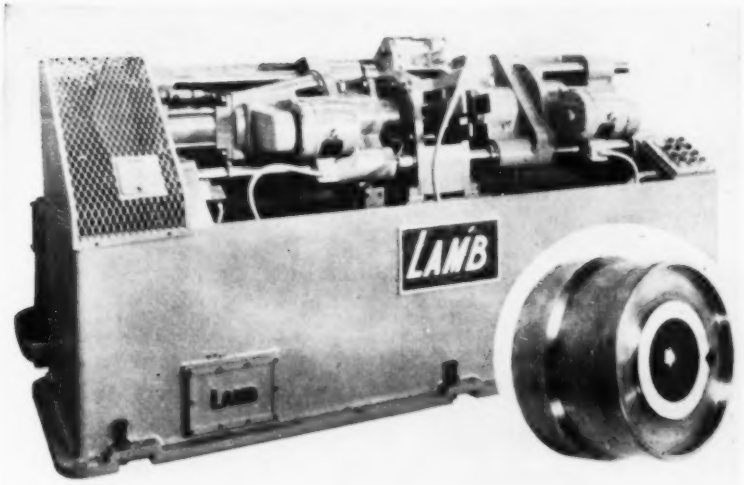
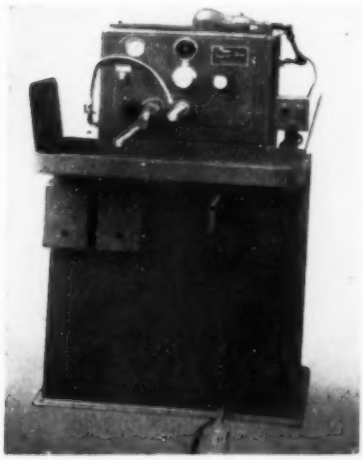
ROLL GRINDERS—*Cincinnati Grinders Inc, Cincinnati 9, Ohio.* Filmatic traveling wheelhead roll grinders are available in four sizes, 36, 44, 50 and 60 in. The 36-in. size is cataloged in 10- to 20-ft lengths, and other sizes in 12- to 24-ft lengths. Carriage traverse is infinitely adjustable from ¾ to 75 ipm. Roll cambering mechanism operates on the tilting wheelhead principle. The grinding wheel truing unit is the profile type and is hydraulically operated (Aug 11, p120).

LAPPING MACHINE — *Taft-Peirce Mfg Co, Woonsocket, RI.* This 24-in. semi-automatic lapping machine can deliver flatness to less than one light band (0.00011 in.) and a surface finish as low as 1 mu-in. rms. Designed primarily for lapping small parts in production lots, machine can also accommodate any part that will fit in any one of the truing rings, which have an 8⅞-in. OD. Lapping table speed is infinitely adjustable from 16 to 76 rpm (Jun 30, p109).



LAPPING MACHINES—*Syntron Co, 311 Lexington Ave, Homer City, Penna.* Vibratory lapping machines have following improvements: steeper leaf spring angle in drive unit creates greater horizontal pan movement, permitting more effective lapping of thinner parts (to 0.0010 in.); new pan sizes in range of from 5 to 30 in. dia; special clamping ring for holding abrasive cloth in unit's pan (Jun 16, p170).

AUTOMATIC BURNISHING MACHINE—*F Jos Lamb Co, 5663 E Nine Mile Rd, Detroit 34, Mich.* Machine burnishes two opposing faces of a cast iron transmission drum at rate of 360 pieces per hr. Machine cycle time is 8 sec; finish is 15-25 rms. Two opposing heads are controlled to give equalized burnishing tool pressure. Both manual and automatic operation are possible, with burnishing time adjustable from 1 to 55 sec (Mar 10, p170).



HONING MACHINE — *Superior Hone Corp, 1605 Elreno St, Elkhart, Ind.* Model HM manually-operated machine has a self-contained hydraulic system for operation of stone pressure, clutch and brake. Constant stone pressure compensates for stone wear and stock removal; gage on face of machine shows actual pressure. Spindle speeds are infinitely adjustable from 250 to 1150 rpm (Apr 21, p192).

WET BLAST HONER — *Tobin-Arp Mfg Co, 6400 Penn Ave South, Minneapolis 23, Minn.* Liqui-Breez is designed for honing all types of tungsten-carbide and HSS cutting tools and drills. Applications include high quality finish deburring of small machined parts. Unit has working chamber 13 in. high, 18 in. dia. It is furnished with factory installed rubber gauntlets, viewing scope and shield (Nov 17, p273).

LAPPING MACHINE — *Crane Packing Co, Dept AMN, 6400 Oakton St, Morton Grove, Ill.* Model 10 will consistently reface mechanical seals, valve seats, compressor disks, and a variety of other parts to a precision flatness of 0.0000116 in. and with micro-finishes of 2 to 3 rms. Machine has two conditioning rings mounted on 10-in.-dia lap plate which also serve as workholders to accommodate parts up to 3¾ in. dia (Mar 10, p174).

LAPPING MACHINE—*Spitfire Tool & Machine Co, 2931 N Pulaski Rd, Chicago 41, Ill.* Gyro-Matic 12-in. flat lapping machine operates with company's workholder retainer rings that guide piece parts and permit a constant rotating movement. Abrasive selector allows rapid selection of correct flow; positive flow to working area is provided by a newly designed feed line (Nov 17, p246).

LAPPING MACHINE — *Spitfire Tool and Machine Co, 2931 N Pulaski Rd, Chicago 41, Ill.* The Spitfire 9-in. flat lapping machine features a 9-in. cast-iron-alloy lapping plate. Designed for semi-automatic operation, the machine is capable of turning out volume production to tolerances of 11.6 millionths of an inch. For automatic operation, an automatic timer is also incorporated for control of lapping cycle (Jun 2, p126).

CRANKSHAFT LAPPING MACHINE *Norton Co, Worcester 6, Mass.* No. 31 Crank-O-Lap is designed to produce fine surface finishes on external diameters of automotive crankshafts; is also suited to improving the finish on other types of parts. Machine laps pins and bearings simultaneously in an automatic cycle. Unit can be adapted to automatic workloading and unloading (Nov 17, p240).

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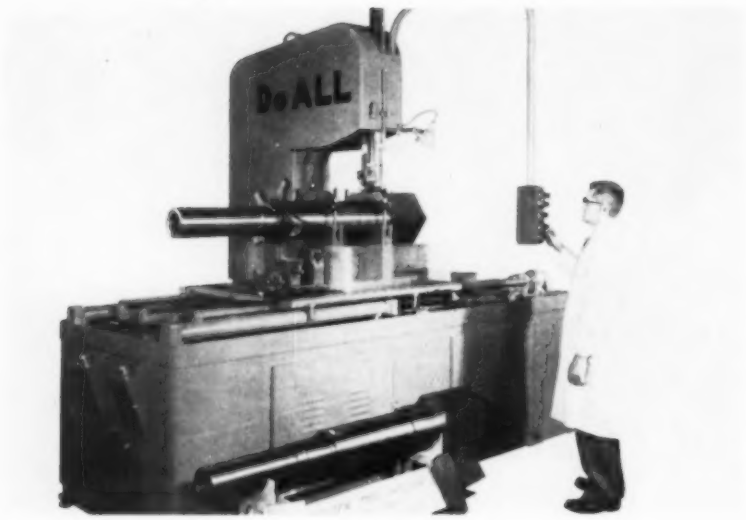
CUTOFF AND FILING

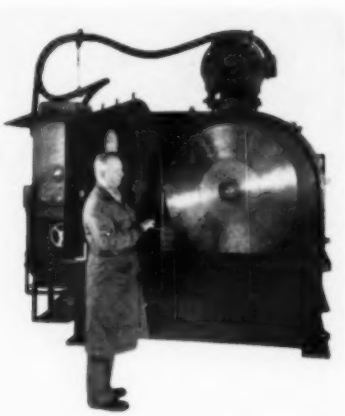


BAND MILL — *DoAll Co, Des Plaines, Ill.* Model 26-5 band mill rips heavy plate, shanks or refaces forging dies, trims heavy castings or slabs massive billets. Machine has capacity of 24 x 26 in. and a variable band speed of 50 to 5000 fpm. For heavy work or for cutting high alloys, feeds as low as 0.030 ipm are available. Hydraulic cylinders provide rapid traverse and feeds up to 8 fpm (Mar 10, p157).

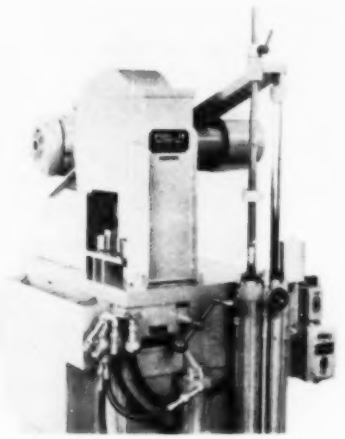
ABRASIVE CUTTING MACHINE — *American Chain & Cable Co, Inc, Allison-Campbell Div, 929 Connecticut Ave, Bridgeport 2, Conn.* The Sever-All Model 1-A, a small but heavy-duty dry abrasive cutting machine, cuts ferrous or nonferrous metal. Machine can cut up to 2x2-in. solids, 3-in. standard pipe, 3x4-in. angle iron and 4-in. channel. Oscillating action of wheel reduces arc of contact between wheel and work (Aug 25, p102).

TUBE CUTOFF MACHINE — *Grieder Industrial, Inc, Bowling Green, Ohio.* Range of tube sizes that can be cut on this machine has been increased from 2 in. to 2¼ in. OD, to accommodate all sizes from most tube mills. Other improvements include an air-mist cutting oil system, automatic lubrication and improved feed rolls. Machine can cut tubes at rates higher than 6000 pieces per hr (Mar 10, p184).

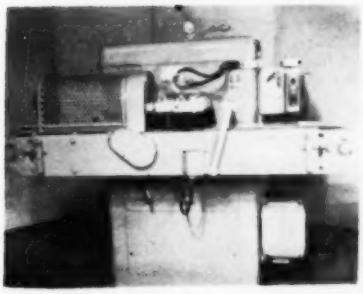
DIE FILER CHUCK—*Sales Service Machine Tool Co, 2363 University Ave, St Paul 1¼, Minn.* Improved file chuck for Keller Die Filers has a floating jaw that is tightened by a single screw, accommodating itself to any shape file shank. A recess in the chuck post provides extra support for the shank (Oct 6, p137).



FRICTION SAW—*Ty-Sa-Man Machine Co, Inc, 1001 White Ave, Knoxville, Tenn.* Friction saw is reported to incorporate several major innovations. A new electronic feed replaces the old hydraulic system; a unique coolant system assures cool-edge, dry-blade cutting; and one-piece construction permits the saw to be used as a semi-portable unit or without a pit (Jul 14, p124).

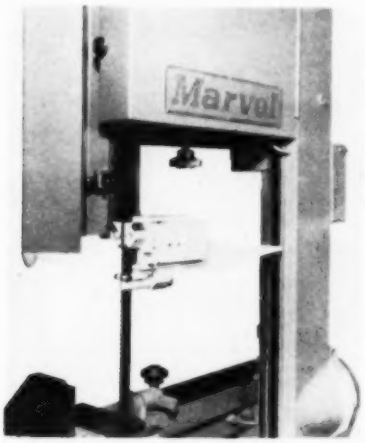


OSCILLATING CUTOFF MACHINE—*American Chain & Cable Co, Inc, Allison-Campbell Div, Bridgeport 2, Conn.* Model 28 Sever-All has capacity to handle solid steel up to 4 in. square, 6-in. angles, 8-in. channels and 4 in.-OD piping or tubing at 90° to axis. Machine is an oscillating type unit in which the abrasive cutting wheel and workpieces are manually fed by the operator. The machine can be equipped with 18 or 20-in. wheels (Feb 24, p150).



CUTTING MACHINE—*Motch & Merryweather Machinery Co. Wink Cutter Div. 1250 E 222nd St. Cleveland 17, Ohio.* Model 420-C Wink cutter is a high-speed precision machine designed for cutting rubber, plastic, textile fiber, and other hot or cold extruded materials at extremely high speeds (Jul 28, p102).

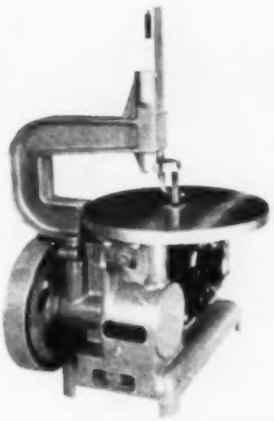
CUTOFF SAW — *Backus Machine Works, Carlstadt, NJ.* Model R-1000-A cutoff saw is designed for high speed, accurate cutting of small bars, shapes, tubing and pipe of steel, alloys or other ferrous metals. Removable guard permits easy changing of wheels. An opening in table allows short pieces to drop into container below table (Mar 10, p157).



BANDSAW STEERING GEAR—*Armstrong-Blum Mfg Co. 5700 W Bloomingdale Ave. Chicago 39, Ill.* "Sure-Line" servomechanism bulit into No. 81 Marvel bandsaw compensates for uneven blade wear and wandering to produce straight cuts within a few thousandths, which increases blade life. Carbide sensing tips detect blade runout; mechanical linkage operates switches to operate motor, drive gear, and rotate blade guides (Nov 3, p96).

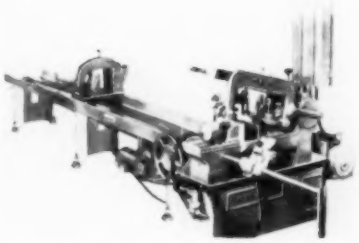
METAL-CUTTING BANDSAW — *Cutron Mfg Co. 303 N Ave U. Lubbock, Texas.* Model E has capacity of 11 x 20 in., will cut 11-in. rounds, 10-in. pipe, and will cut 6-in. pipe on 45° angle. It has four speeds—42, 79, 134 and 210 sfpm. The controlled hydraulic system in the balanced head maintains constant, equalized pressure on blade throughout cut (Mar 10, p158).

PIPE NOTCHER—*Racine Hydraulics & Machinery, Inc, Machinery Div. 2000 Albert St. Racine, Wis.* Machine is an adaptation of a Stub Model 816-W4 power hacksaw. Unit has a 5-in. stroke, speeds of 35, 70, 100 or 140 spm, and uses an 18-in. HSS blade. All work is cut in pairs (Aug 11, p138).

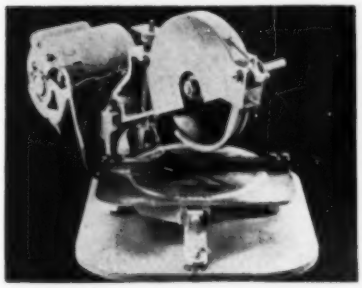


CONTOUR SAWING AND FILING MACHINE—*Oliver Instrument Co. E Maumee St. Adrian, Mich.* All sawing, filing and lapping operations of this machine can be performed by an ordinary mechanic. Dies and tools can be shaped so that hand filing and other finishing operations are not required. Machine is available in five types, either bench or pedestal (Sep 8, p129).

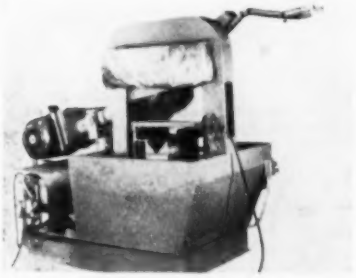
TUBE-CUTOFF MACHINE — *Continental Machine Co. 1952 N Maud Ave. Chicago 14, Ill.* Unit employing two opposed, slightly offset wheels for fast cutting through wall thickness of metal tubes, permits proceeding to subsequent fabrications without deburring. Capacity is 4½ to 8⅝-in.-OD tubing, from light wall up to ¼-in. thickness. Both roller and cutters return to starting position automatically when operator releases air valve (Jan 13, p158).



AUTOMATIC CUTOFF MACHINE — *Racine Hydraulics & Machinery, Inc, 2000 Albert St. Racine, Wis.* Utility Automatic is designed for auxiliary service, short run work, handling overloads. It will cut cold rolled steels, cast iron, HSS, hard alloys, as well as titanium alloys. Models 66W4A (2 or 4-speed) give 1-in. pushup per second. Accuracies to 0.005 in. are assured by a microswitch control (Mar 24, p158).

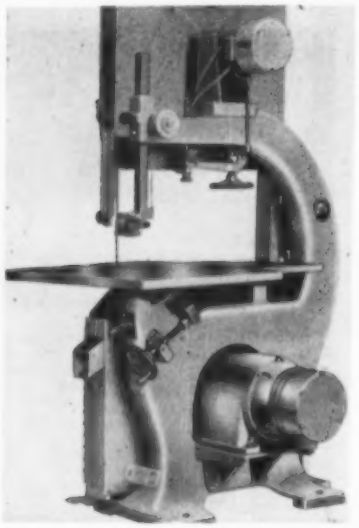


PORTABLE CHOP SAW—*Irvington Machine Works, 1808 N E 7th Ave, Portland 12, Ore.* Model 29 is designed for cutoff jobs on nonferrous metals where accuracy within thousandths is required. Unit can make straight, angle, or compound cuts; no counterweight adjustment is needed. Saw table is calibrated in degrees to aid setting. V-belt and 9-in. saw blade are guarded for safety (Nov 17, p244).

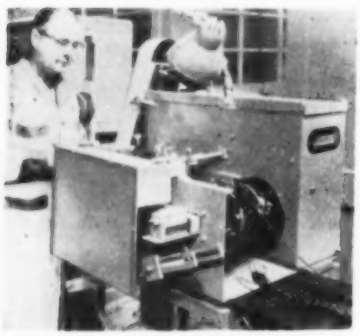


ABRASIVE CUTTING UNIT—*Wallace Supplies Mfg Co. 1300 Diversey Pkwy. Chicago 14, Ill.* See-Saw wet or dry abrasive cutting machine can travel over a prescribed distance steadily or—should the operator choose—intermittently at any desirable frequency of reciprocation. The operator can follow the contour of the section being cut. It will cut 3 x 18-in. plate, 18-in. channel, 8-in. round or square bar, 8 x 8 x 1-in. angles or any comparable sections (May 19, p148).

BANDSAW-CUTOFF SAW — *Wells Mfg Corp. 505 Roosevelt Rd, Three Rivers, Mich.* Convertible metal-cutting bandsaw, Model 58-B, is designed for dual duty—as an upright bandsaw or as a horizontal cutoff saw. As a horizontal machine, it handles rounds up to 6 in., rectangular shapes up to 6 x 10 in., and 5 x 5 in. at 45°. The machine easily converts to an upright saw—just swing the head to vertical position, and install worktable. Selective speeds are 76, 141 and 268 rpm (Aug 11, p121).



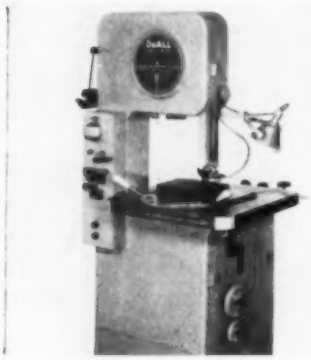
HEAVY-DUTY BANDSAWS — *Northfield Foundry & Machine Co, Northfield, Minn.* 36-in. bandsaws are now furnished with stronger frame, tension indicator, and blade tracking guide. Units are available in direct motor drive, 2 to 7½ hp, and with belt drive. Belt-driven models are adaptable to cutting metals, plastics, woods. These units are also available with greater capacities under guide, and for LH operation (Dec 15, p138).



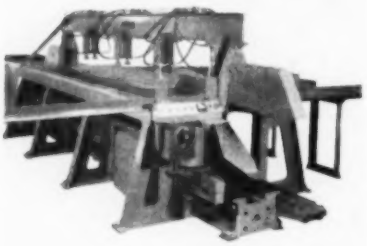
WIRE CUTTER-STRIPPER — *Jennings Machine Corp, 3452 Ludlow St, Philadelphia 4, Penna.* Acme wire cutter and stripper, available in three high-speed models, is completely automatic from unreeling of insulated wire, through simultaneous cutting and stripping, to stacking pieces in a trough. Machine can process over 9000 pieces per hour for 1 to 40-in. wire lengths. On longer lengths rates graduate down to 3000 for 80- to 120-in. lengths (Sep 22, p144).

RADIAL SAW — *Rockwell Mfg Co, Delta Power Tool Div, 487 N Lexington Ave, Pittsburgh 8, Penna.* Delta 16-20-in. radial saw has improved features which include index plunger that permits operator to make quick, positive settings at the most-used angles, and a clamping device that assures positive settings at all other angles. Two new accessories are also available—a safety return and a chain feed control (Sep 8, p142).

BANDSAW TABLE CONTROL — *Do-All Co, Des Plaines, Ill.* DoAll Model 26-3 production band machine can now be equipped with single-cycle automatic table return. After sawing or slotting, job is set up on table and adjustable trip dog on table periphery is set for desired length of cut. Trip dog engages limit switch when table reaches desired infeed point, actuating a solenoid valve to return table to loading position (Mar 24, p158).



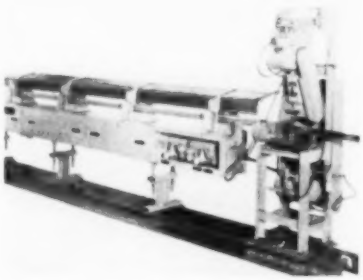
CONTOUR BAND MACHINES—*DoAll Co, Des Plaines Ill.* Model 16M and Model 30M contour band machines are powered by a Speedmaster drive that delivers the full output of the 1-hp motor to the cut throughout 50 to 5200-fpm band speed range. This speed range allows machines to contour saw any machinable material as well as band file, band polish, line grind and friction saw any thin ferrous work (Aug 25, p112).



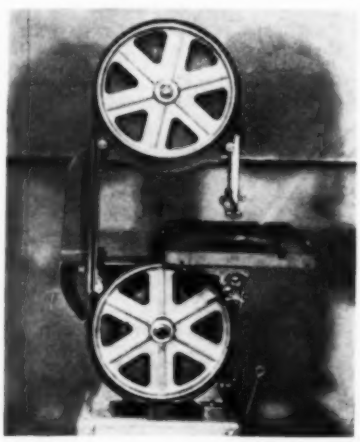
PRODUCTION SAW—*Oliver Machinery Co, 1025 Clancy, NE, Grand Rapids, Mich.* No. 838 Plate Saw is a heavy-duty saw for cutting aluminum, bronze, copper, brass, micarta and other nonferrous metals. Saw unit moves along bed to cut through material. Machine is built in any length from 4 to 40-ft capacity, or longer in 4-ft increments (Sep 22, p136).

METAL-WOOD BANDSAW — *Rockwell Mfg Co, Delta Power Tool Div, 483 N Lexington Ave, Pittsburgh 8, Penna.* Improved model of this 14-in. wood- and metal-cutting bandsaw provides greater rigidity and increased torque transmission. A heavier drive system eliminates chatter and vibration under difficult operating conditions at the extremes of the speed range (40 to 3000 fpm) with a standard 1725-rpm motor (Mar 24, p160).

CASTING SECTIONING SAWS—*Do-All Co, Des Plaines, Ill.* These machines are designed for rapid sectioning of iron, steel and aluminum castings. The smaller machine is a Model 36-2 with 25-in. work height and with a 48-in.-stroke table that travels on Thomson linear ball bushings. The larger machine is a Model 36W with 36-in. work height and with a 48-in.-stroke table running on automatically lubricated V-ways (Nov 17, p238).



CUTOFF MACHINE — *Wallace Supplies Mfg Co, 1300 Diversey Pkwy, Chicago 14, Ill.* Swing cutoff machine is automatically fed. Clamping is done by air. Capacity is 1.9-in. round tube or pipe. Either ferrous materials, cut with abrasives—or nonferrous materials, cut with metal wheel and mist coolant system, may be handled. Machine can be completely automated if desired (Jun 2, p128).



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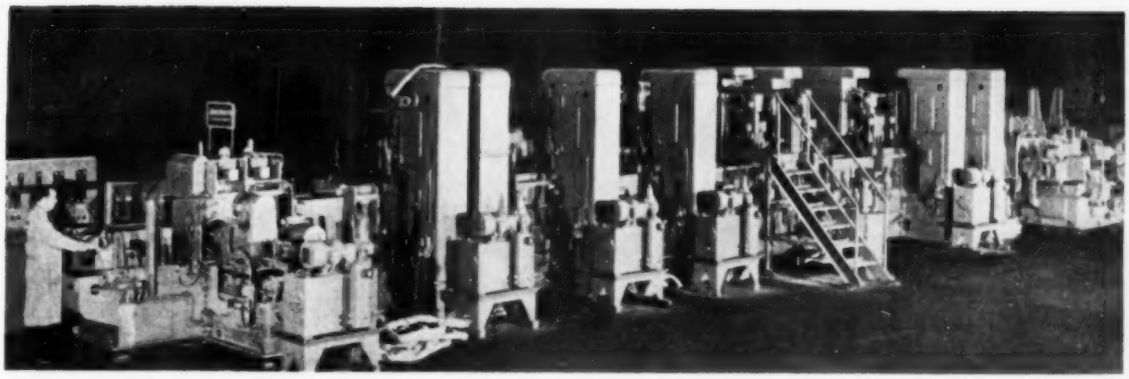
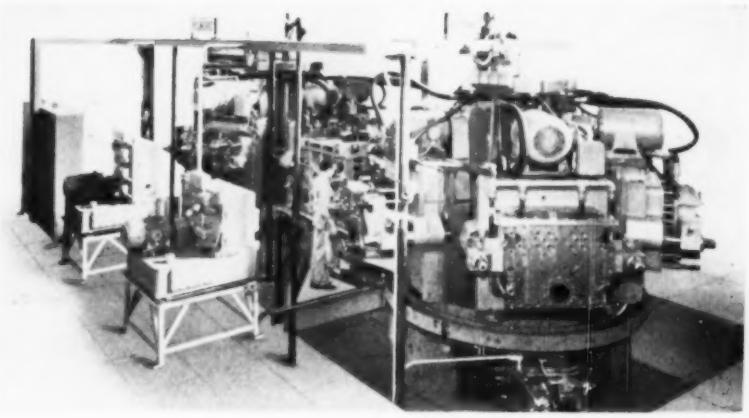
SPECIAL MACHINES

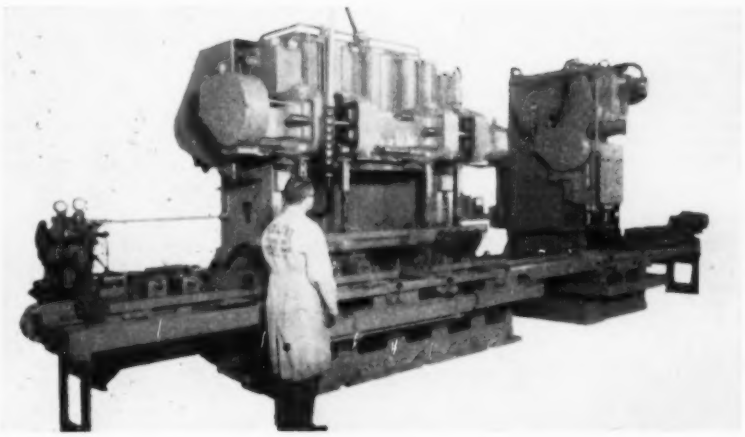


TRANSMISSION EXTENSIONS — *Buhr Machine Tool Co, Ann Arbor, Mich.* Transmission extensions are machined at the rate of 171 per hr on this 85-ft long, 36-station, walking-beam inline transfer machine. Each index moves the aluminum die-cast workpieces two feet down the line. Machine, composed of building-block components, bores, faces, drills, reams, taps, chamfers, spin-faces, air gages and also assembles a bushing into the workpiece (May 19, p154).

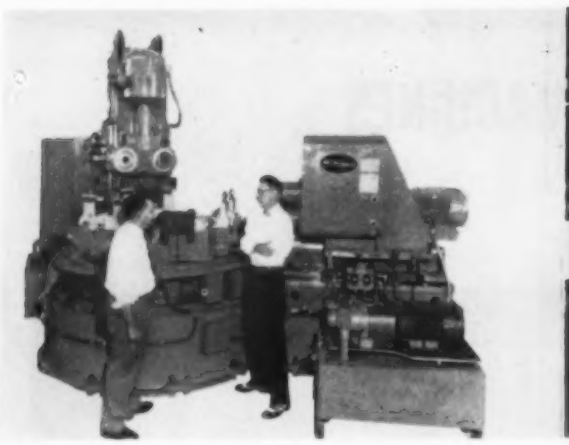


TURRET-TYPE MACHINES — *W F and John Barnes Co, Rockford, Ill.* Special turret-type machines are designed for processing steel parts for road-building equipment. Machines are designed for economy on job-lot operations. Several machines are designed to handle more than one part. Unit illustrated drills, reams, chamfers and taps three different welded steel cases at rate of 2.90 per hr (Mar 24, p144).

AUTOMOBILE VALVE ROCKER ARMS — *Cross Co, Park Grove Station, Detroit 5, Mich.* Parts are processed at the rate of 800 per hr on two six-station dial-type machines. One machine drills and reams the rocker shaft hole, forms the oil groove and drills one oil hole. Other machine drills, chamfers and taps the adjusting screw hole, and counterdrills and spotfaces a second oil hole (Jan 13, p164).



HEAVY STEEL LINKS—*Moline Tool Co, Moline, Ill.* Links are drilled, core drilled or reamed, and finish bored as they are passed along platen workholding fixtures. First and second working stations are on a Model HD68 drilling machine which carries two pairs of spindles on the machine rail. Third station is under the two spindles of a Model 115CB boring machine where the drilled holes are finish bored (Oct 20, p214).



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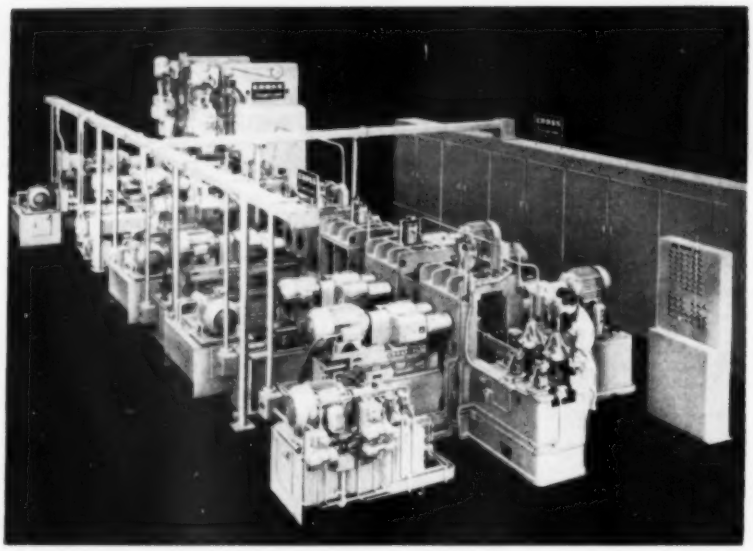
GEAR REDUCING HOUSINGS — *Michigan Drill Head Co, PO Box 4643, Detroit 34, Mich.* — Septuple Production Giant produces, from rough castings to finished parts, seven different sizes of housings, ranging in weight from 85 to 800 lb. Machine consists of 3-station dial-type machine and an 11-station transfer machine. Storage racks and tool boards are provided for the preset tooling (Jun 30, p110).



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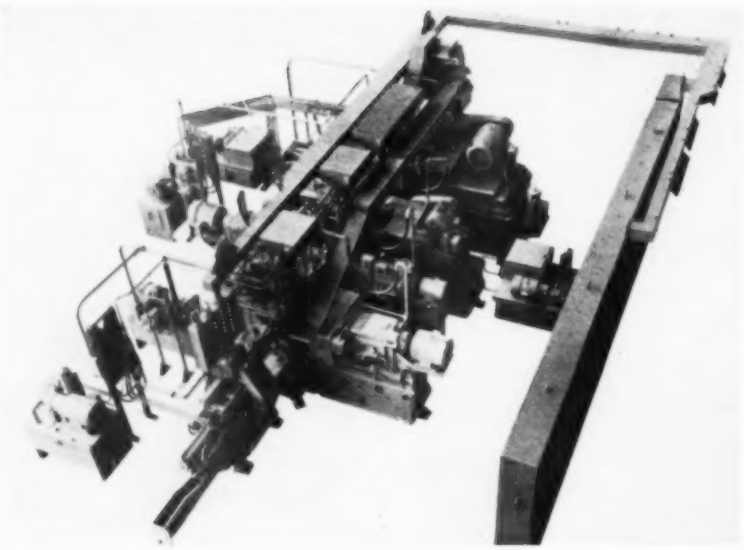
TRANSFER MACHINE—*Cross Co, Park Grove Station, Detroit 5, Mich.* Unit bores axle housings with differential bearing caps assembled. In finishing stations, vertical boring unit first faces shoulder and then bores dia for outer pinion shaft bearing, then bores dia and faces shoulder for inner bearing. At same time, two opposed horizontal units back bore the differential bearing diameters. Rated capacity is 90 pieces per hr; each cycle produces two finished housings (May 5, p150).

AUTOMOTIVE AXLE HOUSING — *Snyder Tool & Engineering Co, 3400 E Lafayette Ave, Detroit 7, Mich.* Housings are machined at the rate of 75 per hr on automated machine which combines a center-column-type machine with an in-line transfer machine. From 76-in.-dia, 4-station center-column machine, semi-finish-machined parts are transferred to 17-station transfer machine (Mar 10, p164).



STEEL CLUTCH DRUMS — *Bodine Corp, Bridgeport, Conn.* Drums are machined at the rate of 300 pieces per 50-minute hour. Twelve operations are performed on this machine which has three horizontal drill spindles; one horizontal tap spindle; one vertical milling spindle; and two inverted drill spindles, one with a two-spindle head. Two automatic inspections are included in cycle (Oct 6, p131).

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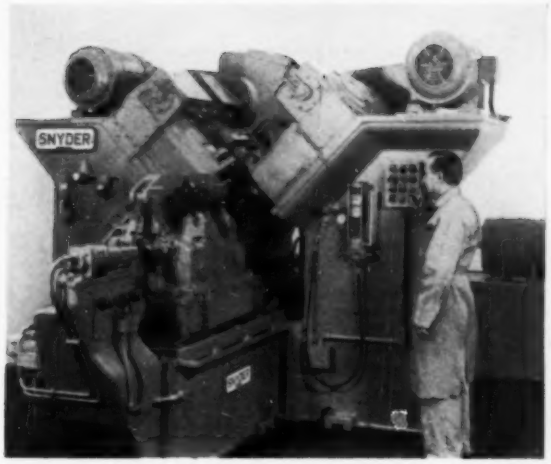
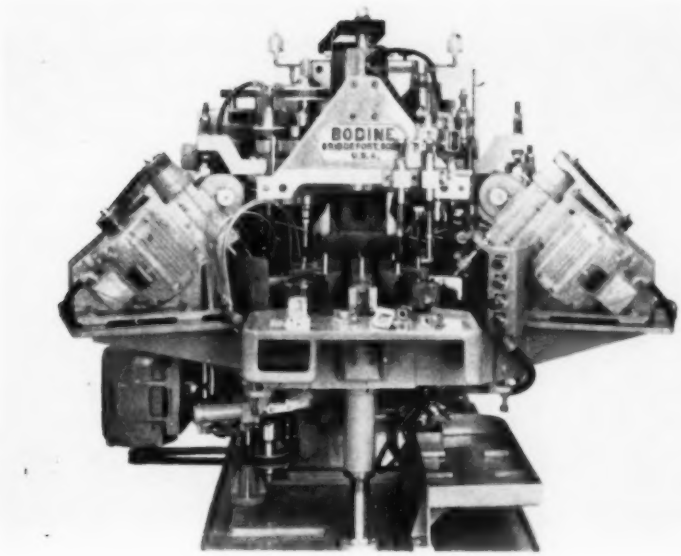
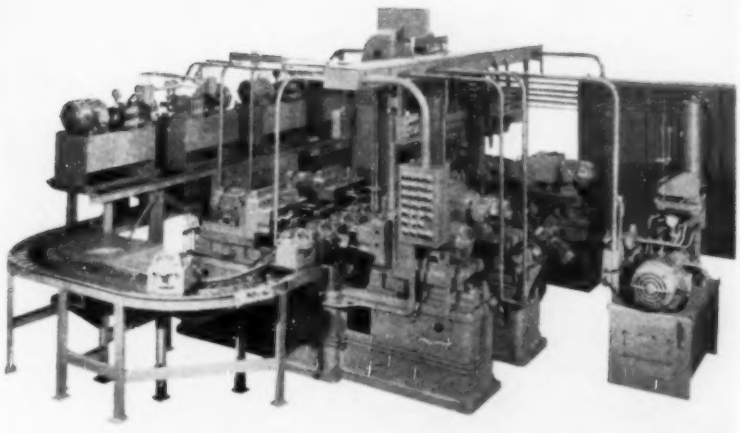
TRUCK ENGINE BEARING CAPS — *National Automatic Tool Co, Richmond, Ind.* Parts are processed on transfer machine at rate of 57 clusters of bearing caps per hr. The first station of this 14-station machine is loaded with a solid casting cluster of one main and four auxiliary bearing caps. The other stations perform 11 operations including drilling, reaming, spotfacing, milling, tapping, sawing and facing (Apr 21, p208).







▲ AUTOMOTIVE INTAKE MANIFOLDS—*Synder Tool & Engineering Co, 3400 E Lafayette, Detroit 7, Mich.* Units are machined in low-production quantities on these special milling and drilling machines. The line index machine (left) rough and finish mills the manifold joint faces; a drilling machine drills and reams location holes; the milling machine (right) mills the water flange and carburetor pad (Sep 8, p128).

◀ VALVE BODIES — *Bodine Corp, 317 Mountain Grove St, Bridgeport 5, Conn.* Zinc die-cast valve bodies pass through six separate drilling, tapping and deburring operations on multi-spindle machine. There are spindles operating vertically from both above and below the index table and there are angular spindles at the sides. Unusual feature is use of reversing lead-screw spindles, one vertical and one inverted, for NPT operations. Production is 15 pieces per min (Jun 30, p116).

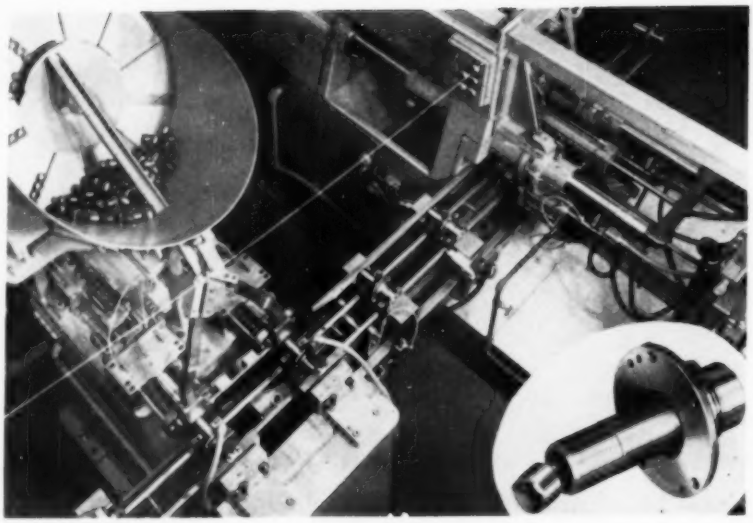
TIERODS—*Davis & Thompson Co, 4460 N 124th St, Milwaukee 18, Wis.* Rear axle tierods are chamfered, both sides of both ends, on this Roto-Matic transfer machine. Operator loads parts on conveyor chain which hydraulically indexes through successive stations through unload. Production is 666 pieces per hr. Cycling is hydraulically and air controlled (Oct 20, p210).

GEAR HOUSING—*Greenlee Bros & Co, 1729 Mason Ave, Rockford, Ill.* Power steering gear housings are machined at a rate of about 240 per hr on this 225-ft-long palletized transfer machine. A total of 128 separate operations are performed on these parts in 37 work stations, using 139 different tools. 89 electric motors produce a total of 642 hp (Jan 13, p150).

◀ TRANSFER MACHINE — *Rehnberg-Jacobson Mfg Co, 2135 Kishwaukee St, Rockford, Ill.* Small 13-station transfer machine, No. 1253, is one of two machines which perform, successively, all drilling, tapping, reaming and chamfering operations on a small cast iron part. Specifications include over-all-size of 17 x 19 ft; 15 pallets, measuring 10½ x 11 in; and a machine cycle of 12½ sec per part (Feb 7, p149).

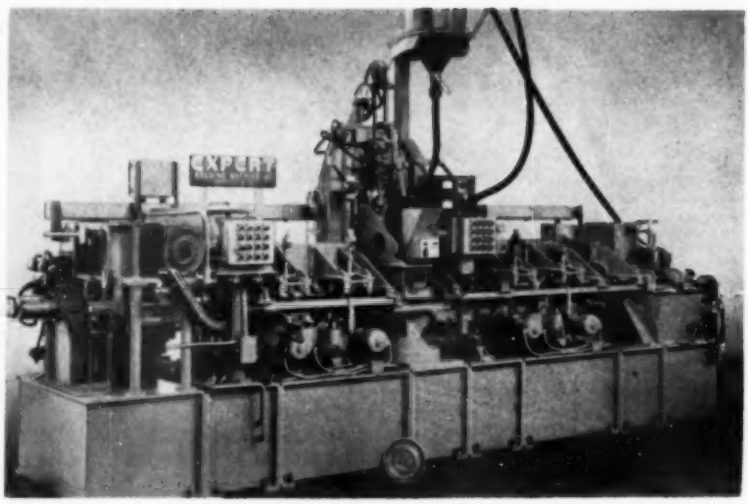
SPECIAL MACHINES

ASSEMBLY AND BORING MACHINE—*F Jos Lamb Co, 5663 E Nine Mile Rd, Detroit 34, Mich.* Machine combines a bushing press fit assembly operation with precision boring. The stator supports are produced at rate of 400 per hr. Tolerance is ±0.0005 in. on boring diameter and 0.002 in. tir on concentricity and squareness. Machine, designed for future integration into a transfer line, may be controlled manually or cycled automatically (Jul 28, p104).



MACHINE CHASSIS — *Swanson-Erie Corp, 810 East 8th St, Erie, Penna.* Series M indexing machine chassis offers new opportunities for designing multiple-station, fully automatic assembly and processing machines. Unit is offered as standard with 6 to 32 index positions, and 36 to 54-in. turret diameters. Unit includes drive components and floor plate (Apr 21, p185).

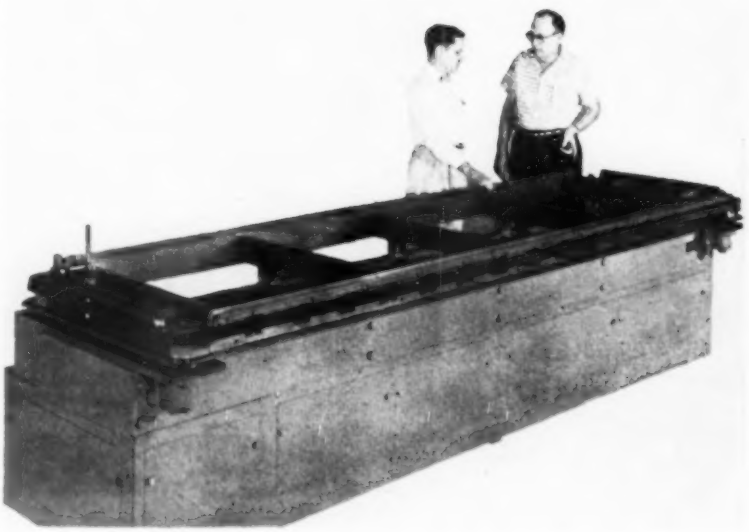
AUTOMOTIVE CRANKSHAFTS — *Buhr Machine Tool Co, Ann Arbor, Mich.* Parts can be produced at rate of 64 per hr on this six-station, two-way trunnion machine, the Economatic C-4761. LH head drills, countersinks, counterbores, spotfaces, and taps one hole in front end; RH head drills, countersinks, and reams eight bolt holes; drills, counterbores, and countersinks one hole in rear end (Feb 10, p174).



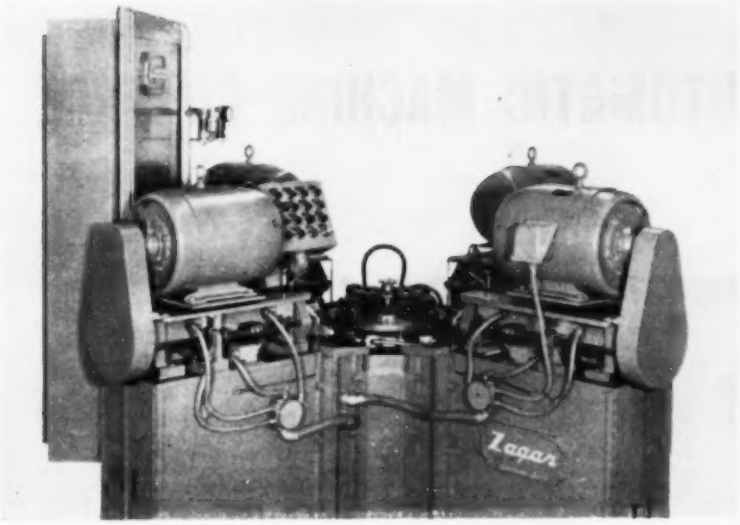
DISK AND HUB ASSEMBLIES—*Expert Welding Machine Div, Expert Die & Tool Co, 17144 Mt Elliott Ave, Detroit 12, Mich.* Transmission units are assembled, preheated, welded and heat treated in one continuous operation on this automated, 10-station, inline transfer welding machine. Production rate is 120 assemblies per hr. Modular construction permits station addition, removal or interchange (Jul 28, p106).

FLANGES AND YOKES—*W K Millholland Machine Co, Inc, 6402 Westfield Blvd, Indianapolis 20, Ind.* Parts for universal joints are machined on four-station dial-type indexing machine that is equipped with the company's W-2000 hydraulic way-type feed unit and a 12-spindle multiple head. Automatic cycle consists of load, drill four holes, ream four holes, spotface (or counterbore) four holes, and unload. Production is 240 pieces per hr (Aug 11, p124).

TAPPING MACHINE—*Kaufman Mfg Co, Manitowoc, Wis.* Flanged valve bodies are drilled, countersunk and tapped on this 3-head Model 10E-1125 tapping machine. The four-spindle heads are provided with six-speed transmission, hydraulically operated adjustable feed, rapid advance, and adjustable dwell (Oct 20, p216).



INDEXING CHASSIS — *Benerson Corp, 1319 W Florida St, Station A Box 127, Evansville, Ind.* Automator is available in two models, OT Series (illustrated) indexes parts carriers around a base frame. The OU Series indexes carriers over and under base frame. These two fill needs of almost all automated operations, such as feeding, machining, fastening, inspecting, packaging and ejecting. Standard models offer indexes of 1¼ to 11¼ in. in length, outputs up to 1500 indexes per hr (May 19, p149).



V-8 CYLINDER HEADS — *Cross Co, Park Grove Station, Detroit 5, Mich.* Heads are assembled at the rate of 310 per hr on this 29-station machine. A transfer mechanism lifts and carries the parts between stations, eliminating pallet fixtures. Building-block construction provides flexibility for engine design changes and for additional automatic assembly devices. Construction to JIC standards and automatic lubrication are featured (Jul 14, p134).

FORGED STEEL CONNECTING RODS — *National Automatic Tool Co, Inc, Richmond, Ind.* Rods are produced at rate of 435 units per hr on these two, 100-in.-dia, 6-position, center column machines. Machines work in series and are arranged to hold six parts in each position. In first machine, piston pin holes are drilled, core-drilled, chamfered and reamed. Parts are then sawed to produce rods and caps. In second machine, two holes for attaching caps to rods are drilled, chamfered and reamed (Mar 10, p168).

AIRCRAFT PARTS—*Zagar, Inc, 23886 Lakeland Blvd, Cleveland 23, Ohio.* Parts are drilled, countersunk and reamed from four sides simultaneously on this 4-station, automatic-cycling machine. The demountable feeders permit change in machining sequence and also permit operations other than those mentioned. Index table rotates parts between feed and return of drillheads. Drilling capacity is 1¼ in. dia; production is 80 pieces per hr (May 5, p154).

TRANSFER MACHINE—*Jeffrey Machine Tool Div, 23281 Telegraph Rd, Detroit 19, Mich.* Unit can perform more than 20 operations on extruded, die-cast or forged parts. Designed to machine and inspect without unloading, machine can be made in any length from 4 ft on up. Hydraulic unit powers pallet hold-down, shot-bolt operation, and fixture locking and unlocking. Features include built-in coolant system and conveyorized chip removal (May 5, p151).

MULTI-OPERATION MACHINES—*Buhr Machine Tool Co, Ann Arbor, Mich.* Automatically controlled machines combine the advantages of multiple operations in automatic in-line sequence with the ability to switch rapidly from producing one part to another of entirely different dimensions and shape. Further increasing the flexibility is the use of building-block components (Jun 2, p120).

PUMP BODIES—*F Jos Lamb Co, 5663 E Nine Mile Rd, Detroit 34, Mich.* Pump bodies are machined on 31-station transfer machine at rate of 378 per hr. This machine, an example of building-block unitized construction, machines the part from five different angles and three positions, and employs practically every known method of machining holes. The transfer mechanism is of the walking-beam type (Sep 22, p152).

ALUMINUM TRANSMISSION CASES —*Ex-Cell-O Corp, 1200 Oakman Blvd, Detroit 32, Mich.* Cases are produced at the rate of 125 parts per hr on this 24-station transfer machine. Operations include multi-dia boring, facing, milling, air gaging, tapping and washing. Parts are oriented twice during machining, once through 90° and later through 180°. The electrical system uses a modified form of static control (Aug 11, p128).

INDEXING CHASSIS—*Standard Tool & Mfg Co, 237 Laurel Ave, Kearny, NJ.* Model ST-A18 conveyor-type, cam-operated, indexing chassis is available with 27, 35, 43 or 51 work carriers. Indexing time takes place during 120° rotation of the camshaft; the remaining 240° is used for dwell or work time. Chassis is delivered ready for applying the tools or assembly devices to meet individual requirements (Aug 25, p101).

PISTON TRANSFER MACHINE—*F Jos Lamb Co, 5663 E Nine Mile Rd, Detroit 34, Mich.* Unit performs multiple boring, drilling, milling, gaging and marking operations on 450 pistons per hr. Machine is completely automatic. Design provides for complete flexibility when part change occurs. Features include interchangeable fixture parts, integral chip-coolant chutes and numerous safety and control devices (Jun 30, p112).

CAST IRON FRAMES—*Kingsbury Machine Tool Corp, Keene, NH.* Frames for air conditioning units are processed on this nine-unit, 32-spindle automatic at a gross rate of 150 parts per hr. Parts are drilled, chamfered, tapped and reamed by the six horizontal and three vertical units. The 30-in. index table is equipped with seven work fixtures with manual clamping and automatic unclamping (May 19, p164).

TRANSMISSION PARTS—*Kingsbury Machine Tool Corp, Keene, NH.* Die castings for automatic transmissions are drilled, end reamed, countersunk and finish reamed at a rate of 270 parts per hr on this automatic machine consisting of ten units with a total of 19 spindles. A 60-in. index table holds ten work fixtures, with power clamping and automatic unclamping. Bushings guide all tools (Mar 24, p152).

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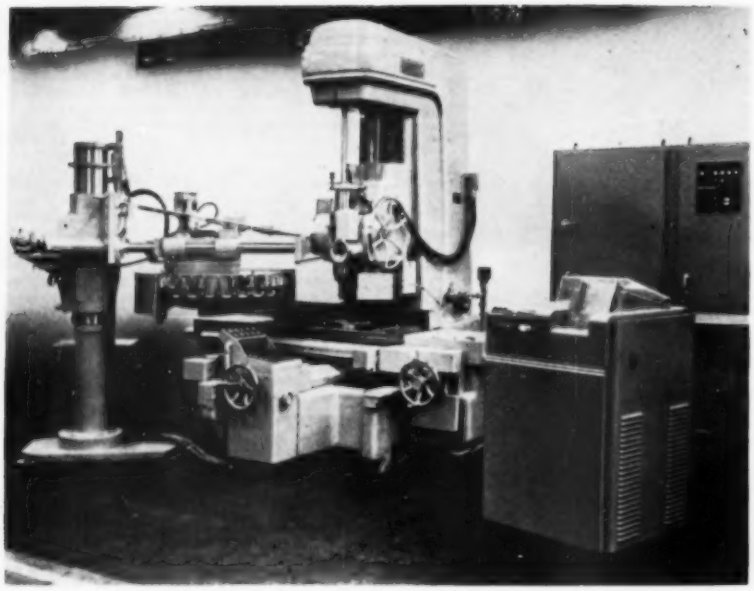
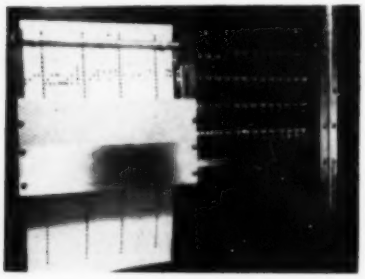
AUTOMATIC MACHINE CONTROL



NUMERICALLY-CONTROLLED JIG BORER — *Fosdick Machine Tool Co, Cincinnati 2, Ohio.* Machine functions, programmed by numerical control using IBM cards, include choice of 30 or more tools, positioning of holes, spindle speeds and feeds, hole depth and spindle head height. Automatic tool selection equipment is faster than manual operation and can be done simultaneously with other machine functions. The 16 spindle speeds range from 30 to 1800 rpm and eight feed rates from 0.0005 to 0.010 ipr (Mar 10, p156).



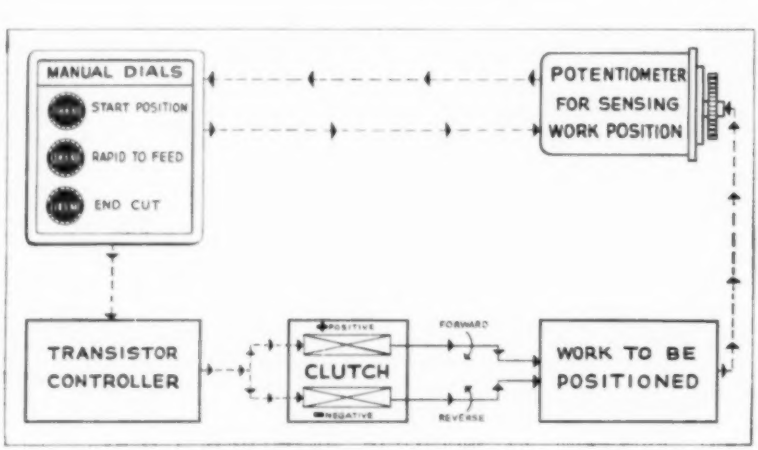
MAGNETIC TAPES—*Minnesota Mining & Mfg Co, 900 Bush St, St Paul 6, Minn.* Magnetic tapes featuring "sandwich construction" eliminate oxide rub-off and outlast conventional instrumentation tapes by ten times or more. A thin, low-friction, plastic layer over the magnetic coating prevents oxide from contacting the recording head, eliminating wear on the oxide. Feature also reduces head cleanup time (Sep 22, p154).

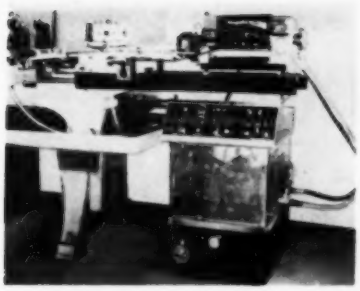
TAPE CONTROL SYSTEM—*Tracer Control Co, Hazel Park, Mich.* The "F" Series Duplimatic Factrol Analog system is a continuous-path magnetic-tape system for controlling motions and auxiliary functions of machine tools. System is a completely standardized unit using identical packages for all machine tools and processes requiring motion control (Jul 28, p102).

PRE-SELECTOR SYSTEM — *Seneca Falls Machine Co, Seneca Falls, NY.* Available as a packaged unit, this electro-mechanical pre-selector system can be applied to machine tools, conveyor systems, and a variety of other work positioning devices. Essentially the system operates by amplifying electrical signals and moving the workpiece to any pre-selected position indicated on the dials. If a new work position setup is desired, it is only necessary to change dial readings (Dec 15, p135).

ELECTRO-MECHANICAL CONTROL SYSTEM—*Seneca Falls Machine Co, Electronics Division, 12 Fyfe Bldg, Seneca Falls, NY.* System has variety of applications. These include use as variable and precise speed controls; vibration exciters; process and proportioning controls; servos for aircraft, trucks, automobiles, and materials handling equipment. Components include a signal comparator, power supply converter, electronic amplifier and mechanical power amplifier (Jun 16, p136).

TAPE OR CARD READER—*Program Control Associates, Box 217, Cathedral Station, New York 25, NY.* Tape or card reader will control an unusually large number of isolated circuits. Equipment can simplify voltage programming circuits which might otherwise require relays for circuit isolation. Unit accepts tapes from 3 to 18 in. wide, with ten circuits (or punched holes) to the inch. Device consists of a tape advance mechanism; a precious-metal contact strip; and a row of wire hole-detecting feelers (Jul 28, p106).

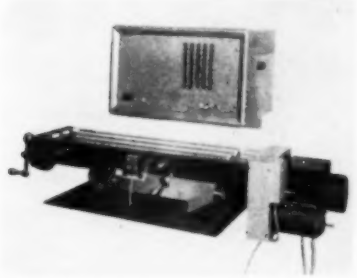




TURRET LATHE CONTROL—*Acme Industrial Co, Hydraulic Div, 200-222 N Laflin St, Chicago 7, Ill.* Hydrive can be attached to any self-indexing turret such as found on turret lathes and hand screw machines. Electronic control of the hydraulic cylinder motion permits stepless feed adjustment from 0 to 240 ipm. Length or depth of cut is controlled within ±0.001 in. (Aug 25, p104).

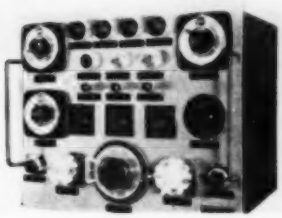
NUMERICAL POSITIONING CONTROLS—*General Electric Co, Schenectady 5, NY.* Packaged units provide semi-automatic or fully-automatic control of point-to-point positioning and direct from one to five linear or rotary motions. Units are designated Mark I-M, I, II, III, IV, and V according to the number of motions they are capable of performing. Prices range from $5140 for the Mark I-M to $32,990 for the five-motion Mark V (Oct 20, p210).

ELECTRONIC INDEX TABLE —*Superior Machine & Engineering Co, 1930 Ferry Park, Detroit 8, Mich.* A 42-in.-dia automatic Omnidex index table, electronically controlled by tape or card, is available in both horizontal and vertical models. Unit positions automatically to one second of arc. All locations are measured absolutely from zero instead of the proceeding point. Continuous check is provided by a visual read-out (Feb 10, p158).



POSITIONING SYSTEM—*Wang Laboratories, Inc, 37 Hurley St, Cambridge 41, Mass.* Numerically controlled positioning system, known as Weditrol, can be adapted to most machines. Specifications include range of 99.999 in. in steps of 0.001 in.; accuracy and repeatability within 0.00025 in. System is available in pushbutton keyboard types for manual setup and fully automatic versions controlled by punched paper tape (Nov 3, p130).

MONITOR SYSTEM — *Control Systems Co, Div of Hancock Industries, Jackson, Mich.* Telecontrol system directs and records all production from a central control room. Each machine or work station is equipped with a control box directly connected to a dispatch center, where audio-visual signals are recorded for management control. Signals reflect work operation, operator problems and down time (Apr 7, p132).



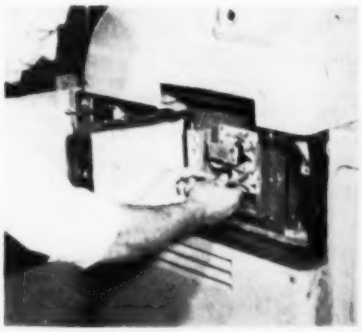
POSITIONING SYSTEM—*CDC Control Services, Inc, 662 S Warminster Rd, Hatboro, Penna.* This automatic point-to-point positioning system uses a direct-dialing analog programmer for rapid machine setup on short production runs. Designed principally for operations such as punching, drilling, inserting, etc, the system saves time by using direct, uncoded programing for repetitive and symmetrical motion patterns (Oct 20, p206).

MANUAL FEED RATE OVERRIDE —*Bendix Aviation Corp, 21820 Wyoming Ave, Detroit 37, Mich.* Manual feedrate override permits operator of numerically controlled machine tools to vary cutter feed rate from that programmed on the control tape. Feature eliminates remaking tapes to provide reduced tool loading in critical areas where variables such as cutter quality, material hardness, vibration, or incorrect feed rate programming cannot be taken into account (Dec 15, p133).

MACHINE CONTROLS — *Sandex Automation Inc, 678 Berriman St, Brooklyn 8, NY.* These air-powered, oil-controlled attachments are designed to automate hand-operated machine tools such as hand screw machines and turret lathes up to No. 5 size, milling machines, surface grinders and drill-presses. Attachments operate on air pressure of 50 to 100 psi and have oil-controlled feed (Apr 21, p183).

NUMERICAL CONTROL PACKAGE —*General Electric Co, Schenectady, 5, NY.* Designated the Mark II, this compact two-motion control unit can be applied to any machine requiring point-to-point positioning of linear or rotary motions. System operates from numerical data stored in standard 8-channel, 1-in.-wide punched tape and/or manually-set decade switches, and is capable of both semi-automatic and fully-automatic operations (Jun 2, p120).

TAPE PREPARATION SYSTEM — *Bendix Aviation Corp, Industrial Controls Section, 21820 Wyoming Ave, Detroit 37, Mich.* Designated the Compac System this is a digital processing system for producing control tapes for 2-D and 3-D contour machining of parts composed of straight lines, arcs, circles and free form or point-defined curves. It takes dimensional and machining information from drawings and produces a coded punched control tape (Dec 1, p152).



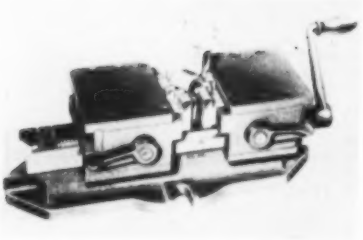
TAPE CONTROL *Potter & Johnston Co, Pawtucket, RI.* New tape control system can be ordered as special equipment on all new P&J 3U, 4U, 6DRE40, 8U and 10U automatic turret lathes or can be added to these models now in use. Starting, stopping, rapid traverse, and speed and feed changes of the spindle, turret and cross-slides are all controlled automatically by tape. Duplicate controls provide for manual operation when required (Mar 24, p150).

CONTROL TAPE—*National Vulcanized Fibre Co, 1055 Beech St, Wilmington 99, Del.* High-strength tape, designed for use on tape-controlled automatic programming equipment, is designated Peerless, and is made of smooth, 0.005-in.-thick vulcanized fiber. It has a tensile strength of better than 6000 psi, high density, low porosity, excellent abrasion resistance, and is easily punched. It falls between paper and polyester film in cost and wearing properties (Aug 25, p116).

TAPE CONTROL SYSTEM — *Micro-Path, Inc, Div of Topp Industries, Inc, 4949 W 104 St, Inglewood, Calif.* The Micro-Path control system combines discrete and continuous path positioning control in a single unit that needs no computer for programming. Operator merely runs the controlled machine through its work by hand a first time. As he does so a stylus records the movements on a magnetic tape, which is then used for subsequent operations. Price: $15-25,000 (Dec 29, p74).

American Machinist 1959 PRODUCTION PREVIEW

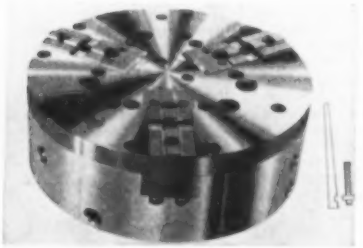
TOOLS AND ACCESSORIES



MULTI-FINGERED VISE — *E W Bliss Co, Die Supply Div, Canton, Ohio.* Reported to have greater holding power than a conventional vise for holding irregularly shaped pieces, Ampogrip can be mounted as a holding fixture on almost any machine. It can also be used as a lathe chuck when turning odd-shaped parts. Vise is available with jaw sizes from 1 9/16 to 6¼ in. (Apr 21, p234).

CLAMP — *Lodding, Inc, Worcester, Mass.* Heavy-duty clamp delivers 10 times the line pressure and is camlocked in event of air failure. This automatic, air-operated device is 3 in. wide, 3⅝ in. high and 8¼ in. long (Apr 7, p132).

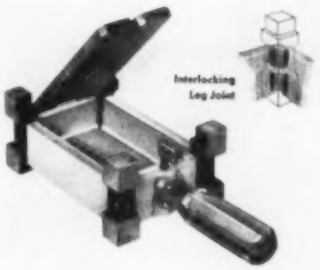
VACUUM CHUCK — *Pioneer Aluminum Inc, 5251 W Imperial Highway, Los Angeles 45, Calif.* Octopus has closely set suction grips that hold nonmagnetic materials firmly in place for drillpress, router, Bullard lathes and other milling operations. Any one or any combination of vacuum apertures can be sealed off, confining gripping area to work at hand (Mar 24, p156).



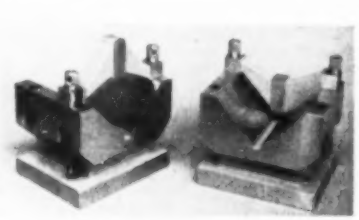
HIGH SPEED POWER CHUCK — *Buck Tool Co, 2015 Schippers Lane, Kalamazoo, Mich.* Designed primarily for the higher spindle speeds needed to take advantage of high speed cutting tools, this chuck provides take-up for wear through the action of two tapered gibs working on tapered keyways under each jaw. Chucks are available in 2-jaw and 3-jaw designs in 6½, 8¼, 10 and 12-in. diameters (Apr 21, p187).

WORKHOLDERS — *Omer E Robbins Co, 11961 Dixie Ave, Detroit 39, Mich.* Magna-Sine magnetic sine plates now incorporate an O S Walker multipole fine-division permanent magnetic chuck to permit better holding of all types of work. Both the magnetic and non-magnetic sine plates have ribbed base plates and intermediate plates for greater strength and rigidity (Apr 21, p185).

AIR CHUCK — *Crodian & Co, 4897 Kessler Blvd, East Drive, Indianapolis 20, Ind.* Model 41A Stace air chuck provides either internal or external chucking. Simple screwdriver operation reverses the chucking direction. Wide variety of chuck jaws available. Tolerances are easily held within 0.0005 in. TIR (Apr 21, p180).



TUMBLE BOX JIGS — *Standard Parts Co, 1039 Broadway, Bedford, Ohio.* Weight of this new line has been reduced by 50% by a unique construction using aluminum, cast iron and steel. Because the legs project, head-type bushings may be used on sides, top or bottom, as required. There are 47 sizes, ranging from 1x1x1 up to 4x8x4 in. (Apr 21, p260).



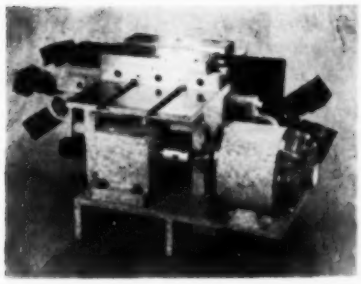
WORKHOLDERS — *Taft-Peirce Mfg Co, Woonsocket, RI.* New 3⅞-in.-capacity V-block is designed as an intermediate size precision setup and inspection tool. It will hold workpieces from ½ to 3⅞ in. in dia. Price is $110 a pair. Other items include a 20-in. sine block; a box angle iron; and two pallet angle irons (8 and 10-in. sizes) (Apr 21, p191).

MINIATURE EXPANDING MANDREL — *Le Count Tool Works, Inc, West Hartford, Conn.* Micro-Mite miniature expanding mandrels are made by a new manufacturing process and utilize hardened and ground tool steel throughout to provide closer tolerances on all mandrel operations. All working parts are stress relieved by deep freezing to insure permanent stabilization and precision. Mandrels range in size from ⅛ to ½ in. (Apr 21, p274).

TWO-JAW INDEXING CHUCK — *Cushman Chuck Co, Hartford, Conn.* Prototype is used to machine all opposing and angular surfaces of flanges and seats of a 4-in. gate valve in one chucking operation. Centered on the master jaws, one of which contains the indexing mechanism, are revolving jaws that rotate at right angles to the master jaw operation. Soft-formed cradle jaws which actually hold the valve body are fastened to the revolving jaws (Apr 21, p237).

EXPANDING COLLETS — *Hardinge Brothers, Inc, Elmira, NY.* Expanding collet assembly is engineered for Hardinge toolroom and production lathes. Exact concentricity is said to simplify obtaining concentric and square shoulders, faces, and diameters from a previously machined bore. Unit eliminates special shouldered expanding collets since back stop is machined in place and is a dead stop (Apr 7, p136).

SLIDE ASSEMBLIES — *Russell T Gilman Inc, 624 Beech St, Grafton, Wis.* Slide assemblies can now be supplied with stroke lengths from ¾ in. to 8 in. and with slide working surfaces from 2 x 3 in. to 8 x 24 in. Both light and heavy-duty models are offered. In addition to the basic slides, other types include control features such as a return spring, micrometer stop, leadscrew, and air or hydraulic cylinder (Apr 21, p196).



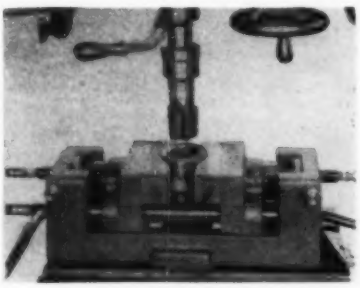
MOTORIZED MILLING FIXTURE—*Sieburg Industries, Inc, Danbury Industrial Park, Danbury, Conn.* Automatic Milled Parts unit is a continuously moving, automatic holding fixture that carries small parts beneath a milling cutter. Parts are held in chain-driven jaws. Fixture can be clamped to any milling machine table. Production rates range from 1500 to 3000 parts per hr (Dec 29, p77).

MACHINE VISE—*Chicago Tool & Engineering Co, 8383 S Chicago Ave, Chicago, Ill.* Palmgren No. 30B is designed for heavy duty service on milling machines, shapers, planers, drillpresses, radial drills, and grinders. It is provided with flanges for clamping to the machine table; may be used with or without 360° graduated swivel base. Unit has jaws 8 in. wide, opens 8 in., and has a jaw depth of 2½ in. (Jun 30, p120).

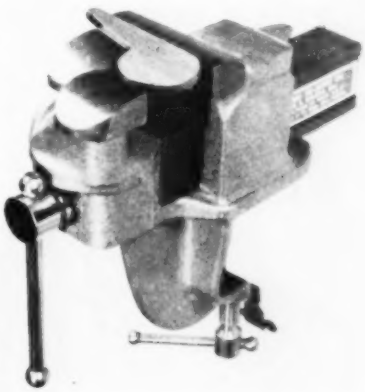
MACHINE VISES—*J E Martin Machine Co, 548 W State St, Springfield, Ohio.* Machine vises, tradenamed Gem, are now equipped for air operation. The use of an air cylinder reduces loading and unloading time. The vises are available in both plain and swivel base styles, and with jaw openings ranging from 3 to 10½ in. (Sep 22, p154).

ANGLE VISE—*Wesson Co, 1220 Woodward Heights Blvd. Ferndale 20, Mich.* Universal Model 1A for compound heavy, medium, or light-duty applications incorporates new wedge-type movement locks that assure setup rigidity up to 3000 lbs torque loading. Jaw capacity is 4 in. Three angular adjustments are provided: 360° rotation of the base; 90° vertical range cradle; and 360° rotation of jaw assembly (Nov 17, p243).

MACHINE VISES — *Chicago Tool & Engineering Co, 8383 S Chicago Ave, Chicago 17, Ill.* The Low-Boy 325B and 425B vises are designed for milling, drilling, shaping, grinding and other operations requiring a rugged holding device. The 325B with swivel base is 3 in. high, has 3¼-in.-wide jaws, 1⅛ in. jaw depth and 3-in. jaw opening. The 425B with swivel base is 3½ in. high, has 4¼-in.-wide jaws, ¼-in. jaw depth and a 4-in. jaw opening (Aug 25, p106).

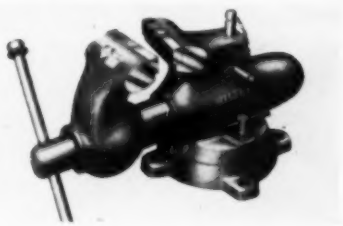


AIR-HYDRAULIC VISE — *Heinrich Tools, Inc, Racine, Wis.* Model 77 holds parts varying in size and shape which call for location of a center or other pre-determined point. Two opposing jaws are cylinder actuated. Specifications: jaw width, 7 in.; max jaw opening, 7¾ in.; max travel for each jaw, 11/16 in.; total jaw travel, 1⅜ in. (Dec 29, p77).



VISE—*R S Wilder, Inc, 26 Bedford St, Waltham 54, Mass.* All-Shapes vise has a pair of pivoted members, mounted on a heavy swivel turret, that replace usual sliding front jaw. Combination of swivel and pivoting action allows the two portions of front jaw to equalize and adjust automatically to practically any shape. Units are available in either clamp-on or swivel-base models with 3-in. capacity (Nov 17, p278).

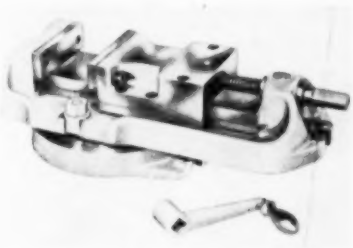
MACHINIST VISE — *Desmond-Stephan Mfg Co, Urbana, Ohio.* Simplex has hardened tool-steel jaw inserts that eliminate screw holes and screw heads in jaw surface and increase gripping area. Jaws are firmly pinned on and can be readily replaced when worn. Positive locking of swivel-base models in any position is assured (Jun 2, p132).



SWIVEL JAW VISE—*Wilton Tool Mfg Co, Inc, Schiller Park, Ill.* Back jaw of vise is on a pivot. A pin holds it in place for straight clamping action; with the pin removed, the jaw can be pivoted right or left to lock angular workpieces securely in place. The vertical locking pin is easily removed by inserting a drift pin in the horizontal hole (Oct 6, p128).

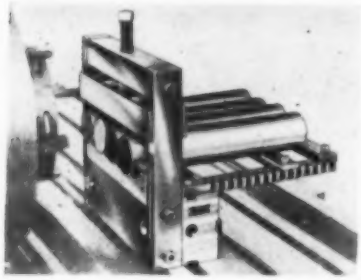
DRILLPRESS VISE—*Alva Allen Industries, Machine Tool Div, Clinton, Mo.* Model X4V has swivel handle, machined slide ways, four holdown feet for easy mounting. Width of jaws is 4 in.; depth, 2 in.; opening, 7 in. Base size, over-all, 6¼ x 11⅛ in. (Jun 16, p152).

SELF-CENTERING AIR VISE—*Heinrich Tools, Inc, Racine, Wis.* Model 11 is designed for holding parts varying in size or shape when work requires location of a center or other pre-determined point; unit finds this point automatically. Two opposing jaws are actuated by air cylinders. The 4-in.-wide jaws are infinitely adjustable to 4⅛-in. opening. Max travel after setting is 2 in. each jaw, a total of 4 in. (Nov 17, p244).



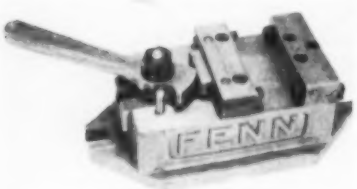
MACHINE VISES—*Skinner Chuck Co, 200 Edgewood Ave, New Britain, Conn.* Trough vises are available in five sizes, 4, 5, 6, 7 and 8 in., with the opening capacity of each vise equal to the jaw width. Deep coolant troughs return all coolant to the machine table. Swivel bases, which are optional, permit setting at any angle in the horizontal plane (Jul 23, p118).

DRILLPRESS VISE — *Wilton Tool Mfg Co, Inc, 9521 Irving Park Rd, Schiller Park, Ill.* Large-jaw-capacity vise provides a jaw opening that is equal to or exceeds the jaw width on all models. Other features include machined top, bottom, and sides; and company's Rapid Titan Nut. Vises are available in three rapid-acting and three conventional-action models, with 3½, 4½ or 6-in. jaws. (May 19, p174).



GANG FIXTURE—*Lassy Tool Co, Plainville, Conn.* Gang fixture provides accurate, efficient milling and grinding of a number of pieces at same time. Compensating jaws clamp each workpiece with equal pressure, even though pieces may vary in size by as much as 1/32 in. The springless clamping is positive and constant (Jun 30, p114).

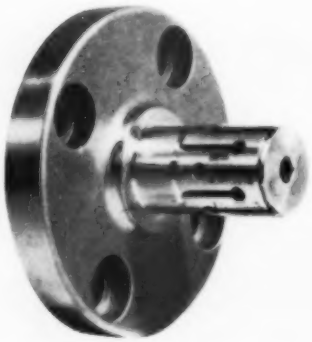
VISE — *Columbian Vise & Mfg Co, Cleveland 4, Ohio.* Made with malleable iron unbreakable castings. Model 224½ is designed for auto body work and woodworking, as well as for sheet metal operations. Unit has a 4½-in. jaw width and a 9-in. jaw opening. Weight is 60 lb (Feb 10, p174).



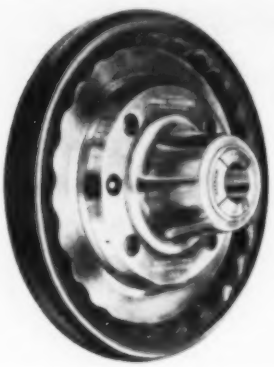
QUICK-ACTION VISE—*Fenn Manufacturing Co, Fenn Rd, Newington, Conn.* Unit operates with cam lever that opens or closes jaws instantly and uniformly. Eccentric handle then locks the work in a doubly secure power grip. Available in three sizes with max openings of 3¼, 4 3/16, and 6 7/16 in. (Jun 16, p126).

EXPANDING COLLET — *Dunham Tool & Mfg Co, Route 37, RFD 4, Danbury, Conn.* The Dunham expanding collet, designed to locate and hold work from the inside, is suited for all existing 5C equipment. The soft mandrel may be machined to fit any ID within the range of the collet. ⅝ to 1⅝ in. Larger and smaller sizes are available; standard length is 1 in. (Jun 16, p128).

COLLET STOP SET—*General Gage Guild, 7570 San Fernando Rd, Sun Valley, Calif.* Style GM5C converts standard 1-in.-capacity lathe collets into solid or spring ejector stop collets without alteration of the standard collets. Set includes solid inserts, spring ejectors and a collet stop body. Price is $9.75 (Oct 20, p238).



ARBOR — *N A Woodworth Co, Standard Products Div, Detroit 20, Mich.* Drawbar model of a shorter arbor and collet is designed for full support on short hole applications. Over-all length of the arbor has been reduced to about 2/3 of the length of standard series. Interchangeable collets will cover range from ½ to 2 9/16 in. Collet expansion is 0.010 in the group from ½ to ⅞ in. and 0.020 from ⅞ to 2 9/16 in. (Mar 10, p160).



COLLET CHUCKS—*Hardinge Brothers, Inc, 1420 College Ave, Elmira, NY.* Increased capacity from 25 to 40°, and greater precision production are claimed for new Hardinge-Sjogren collet chucks. Features include accurate holding of any bar that can be passed through the spindle, without unwieldy draw tube and adapter or sleeve inside the spindle hole found on usual collet attachments (Jan 13, p172).

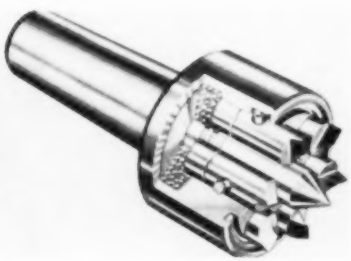
LIVE CENTER—*Vee-Arc Corp, Westboro, Mass.* Live-center for precision turning and grinding is guaranteed accurate to 0.000020 in. Extended nose spindle is carbide-tipped. Preloaded bearings are sealed and grease-packed for lifetime lubrication. Spring design compensates for up to 0.020-in. axial thermal expansion (May 5, p164).

LIVE CENTERS — *Trio Machine & Manufacturing Co, 35700 Vine St, Willoughby, Ohio.* Center points of male, female, pipe, or other design can be interchanged on new Trio live centers, increasing adaptability to a wide range of machining operations. Replaceable points, made of chromium steel, are precision machined for positive seal and ground to guaranteed operating accuracy of 0.0002 in. (May 19, p186).

LIVE CENTER — *J & S Tool Co, 87 Dorsa Ave, Livingston, NJ.* One-piece main body of precision-built live center serves as a cup for the roller bearing on which the spindle turns, permitting use of a much greater-than-normal capacity bearing in a standard size body. Automatic wear adjustment is provided. Units are made in several standard sizes and capacities (Feb 10, p177).

CENTERS — *Detroit Reamer & Tool Co, 780 W Maple Rd, PO Box 174, Birmingham, Mich.* Carbide tips are inserted or removed from Grip-Tip holder by turning a screw. When regrinding is necessary only the tips are reground. Solid-carbide tips are available in ¼ and ½ in. dia, said to be accurate to 0.0005 in.; special diameters can be furnished (May 19, p180).

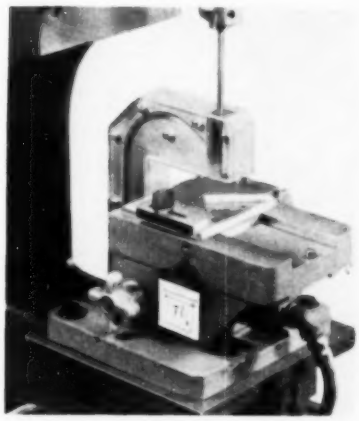
DRIVING CENTER—*R B Tool Co, Inc, 758 N Broadway, White Plains, NY.* Unit is designed to cut production cost of turning and grinding operations between centers by eliminating use of a driving dog. Centers are available from stock with No. 2, 3, 4, 5, 6 Morse Taper with three interchangeable driving plates to hold work from 9/16 in. dia and up (May 5, p164).



DRIVING CENTER—*Ideal Industries Inc, Sycamore, Ill.* Drive unit, named Driving Center, grips one end face of work held between centers, without use of chucks, clamps or dogs. When device is in operation, back ends of driving pins are pressed back into a circular chamber filled with hardened steel balls. Balls act as a "fluid," distributing pressure equally to all driving pins, locking them and centering pin securely when driving points have been driven into work (Mar 10, p164).

SPRING COILING ARBORS—*Sintercast Corp of America, 134 Woodworth Ave, Yonkers, NY.* Arbors are available with Ferro-Tic machinable carbide tips butt-welded to the steel arbor shank. This is reported to eliminate the possibility of braze failure often encountered with tungsten-carbide-tipped arbors. Once hardened the arbor tip resists severe abrasive action (Sep 22, p158).

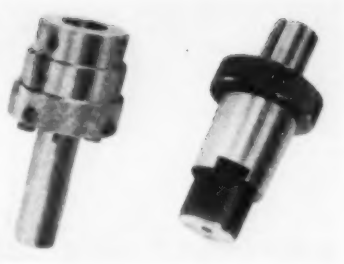
WORK DRIVER—*Seneca Falls Machine Co, 11 Fyfe Bldg, Seneca Falls, NY.* Model, for use on any machine carrying work on centers that require a means of rotation, is designed to eliminate dogging time and to permit an operator to handle two or more machines. Angular serrations of the jaws provide overlapping contact and positive quick grip. Unit is available in 18 standard sizes with work diameters from ¼ to 6⅞ in. (Jun 30, p114).



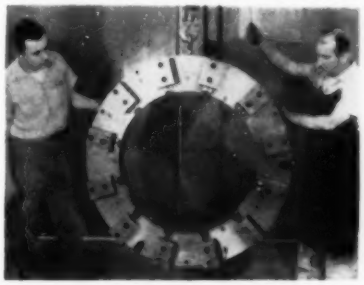
BALL BURNISHING FIXTURE — *Industrial Tectonics, Inc, 3686 Jackson Rd, Ann Arbor, Mich.* Ball-O-Matic is used for sizing and finishing holes by the company's ballizing process. Fixture accommodates wide range of parts for ballizing holes of 1/16 to ½ in. dia. and can be used on an arbor press or any other machine having a ram which will hold a push rod. V-shaped anvil takes parts up to 3 in. OD and 1⅝ in. high (Mar 10, p166).

STEP BLOCKS—*Northwestern Tools, Inc, 114 Hollier Ave, Dayton 3, Ohio.* Step block and clamp sets include clamps for ½-in. bolts with standard 1-in.-wide blocks. Also available with standard blocks are clamps for ⅜ and ⅝-in. bolts. Clamps for ½-in. and ⅝-in. bolts, together with units for ¾-in. bolts, are available in a heavy-duty set with blocks 1½ in. wide. Clamps for 1-in. bolts are furnished in a double-duty set with blocks 2 in. wide (Sep 8, p154).

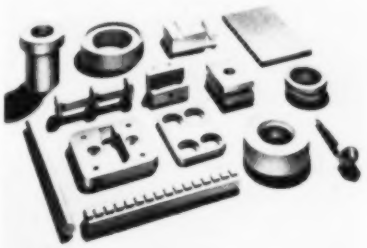
CHUCK WRENCH—*Power-Grip, Inc, 25 George St, Wallingford, Conn.* Available in 15 sizes, this socket chuck wrench is designed to fit all types and sizes of lathe chucks now in use. Also available is the new L-handle spinner wrench, made in two sizes, to provide the lathe operator with more leverage, less weight and faster operation of his chuck, when used with the socket chuck wrench (Aug 11, p142).



CHUCKS — *Precision Processing Co, 3269 Casitas, Los Angeles, Calif.* PreCor internal collet chuck features interchangeable collets ranging from 0.500 to 1.250 in. Collet bodies are of soft steel and may be machined to production requirements. PreCor Align-A-Chuck provides corrections for misaligned turrets as well as angular, vertical, horizontal, and radial inaccuracies found in tailstocks, arbors, and spindles (Feb 10, p165).



12-JAW CHUCK—*Horton Chuck Division, United-Greenfield Corp, New Haven, Conn.* Chuck is 46 in. in diameter and can be used singly on vertical lathes, or in pairs on horizontal lathes for missile parts, subassemblies, and complete missile tank assemblies. Designed to perform to close tolerances, chuck is rated to repeat within 0.002-in. TIR at the diameter to which the top jaws have been machined (Nov 17, p243).

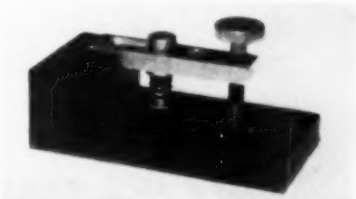


WORKHOLDING DEVICES—*American Lava Corp, Cherokee Blvd & Mfgrs Rd, Chattanooga 5, Tenn.* AlSiMag ceramic or Grade A Lava custom-made jigs, fixtures, support rings, and workholding devices are reported to have excellent thermal shock resistance and dimensional stability. Parts have demonstrated superiority in induction heating, brazing, welding, soldering, and other processes involving high temperatures (Jun 2, p124).

DIAPHRAGM CHUCK—*N A Woodworth Co, Sales Div, 1300 E Nine Mile Rd, Detroit 20, Mich.* Diaphragm chuck, SC 401, is designed for high speed boring or grinding on single and multiple spindles. Recommended part range is from ⅛ to 3 in. dia. Air-operated unit, 4⅞ in. nominal dia, assures consistently controlled concentricity at spindle speeds up to 5000 rpm. Standard item has three adjustable jaws and fixed stop facilities (Jul 14, p144).

CHUCK JAWS—*Rolls Chuck Div, Rolls-Harriman Inc, Rte 17M, PO Box 357, Harriman, NY.* Soft blank top jaws for all chucks with American Standard master jaws are made of leaded low-carbon steel. Material is suitable for case-hardening after machining. Sizes are available for 2- and 3-jaw air-operated power chucks, for 2-, 3- and 4-jaw manually operated chucks, and for chucks with dovetail master jaws (Sep 22, p163).

DRILL JIGS— *N A Woodworth Co, 1300 E Nine Mile Rd, Detroit 20, Mich.* Wedge-lok and Air-lok incorporate twin air cylinders built into the base casting, which actuate the jig posts to raise and lower the bushing plate. Wedge-lok includes an internal locking mechanism on each post. Bushing plate remains in a clamped position with the air off. Air-lok depends upon a constant line pressure to effect clamping (Dec 1, p158).



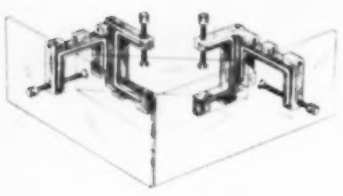
CLAMPS—*PIC Design Corp, 477 Atlantic Ave, East Rockaway, NY.* Sliding swivel clamps are designed for clamping unfinished case surfaces. They are available in 12 different sizes and in two styles, front or rear clamping (Aug 11, p121).

FIXTURE CLAMP—*Saxton Mfg Co, 1517 N Potrero Ave, South El Monte, Calif.* Model 9F Kant-Twist, said to be the largest ever manufactured, was designed for a specific job, but applications are broad and varied (Dec 15, p137).

QUICK-ACTING CLAMP—*Research Engineering and Sales Co, 1011 Longfellow, Royal Oak, Mich.* WMF all-purpose clamp is positioned by merely pulling the clamps out to the desired position. Self-aligning pad takes up irregularities in the material being held. Clamp has a 1½-in. throat depth; jaw opening ranges from 0 to 1¼ or from 0 to 3¾ in. (May 19, p170).

CLAMP KIT—*Hi-Lo Products Co, 8817 Lyndon Ave, Detroit 38, Mich.* Kit contains all the pieces necessary for clamping work of any size onto bolster or angle plates. Kits are available in two standard sizes, both with ⅝ or ¾-in. T-nuts. Milling machine size will accommodate work heights from ⅜ to 11 in.; boring mill or planer model will take work heights from ¾ in. to 49½ in. (Jul 14, p138).

TOGGLE CLAMP — *Consolidated Equipment Co, Inc, PO Box 2216, Pawnee Ave at K-12 Highway, Wichita 1, Kan.* Model 500 features carbon steel workholding bars, straight handle and right-angle base. Plastic hand grip provides non-slip gripping surface. Sixteen models are available in this series, with recommended holding pressures ranging from 325 to 500 lb (Sep 8, p151).



INTERLOCKING CLAMPS — *Merrill Bros, Artic St, Maspeth, NY.* Designed to act as temporary jigs or lowcost fixtures, these Third Hand clamps resemble squared-off C-clamps. They may be joined together back to back, top to bottom, in parallel, vertical and horizontal positions, or at angles of 45, 90 or 180 degrees—nine different combinations for each pair of clamps. Made of forged steel, clamps have jaw openings from 2 to 6 in. (Mar 10, p184).

C-CLAMP SWIVEL—*Wilton Tool Mfg Co, Inc, Schiller Park, Ill.* Perma-Pad C-Clamp swivel pads are available for installation on any clamp. Only tool needed is a screwdriver. These "loss-proof" swivels are held on by a retaining ring instead of by crimping, and have a free swing through a 60° arc. (Jul 28, p120).

TOOL COMPONENTS—*PIC Design Corp, 4177 Atlantic Ave, East Rockaway, LI, NY.* Tool component line, available from stock, includes tool and fixture components, clamps, swivel washers, jig legs, jig buttons. All parts are made of stainless steel. Catalog 16 lists selection of over 500 different items (Jun 16, p166).

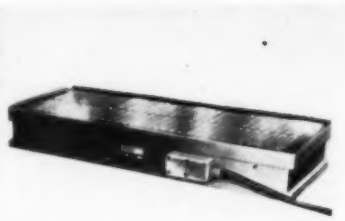
CLAMP — *Lodding, Inc, Worcester, Mass.* Double-acting retracting clamp delivers pressure in two directions simultaneously. Said to be first unit in a standard line that eliminates use of two clamps for various types of holding, it is available in hand-knob, nut, and hand-cam models (Feb 10, p178).

C-CLAMPS—*Wilton Tool Mfg Co, 9525 Irving Park Rd, Schiller Park, Ill.* C-clamps, Rapid titan line, feature a body and nut cavity cast from a single one-piece mold with nut housing opening from the side instead of from the top; this is said to eliminate any possibility of shift in location of the cavity with respect to external shape of the clamp (Jun 16, p162).

FIXTURE CLAMPS—*Harco Engineering, 12092 Woodbine, Detroit, Mich.* Clamps with hand knobs are furnished in a variety of sizes with ¼, 5/16, ⅜, ½, and ⅝-in. studs. Several lengths of clamp straps are available for each size except the ¼-in. (Jun 16, p158).

TOOL CLAMPS — *PIC Design Corp 4177 Atlantic Ave, East Rockaway, NY.* Tool clamps, stainless, hardened and heat-treated Type 2000, are available in sliding swivel, flat sliding, and swinging taper nose styles for a wide variety of tool design jig and milling fixtures. Tool component catalog available (Dec 5, p133).

BENDING POST AND HORIZONTAL CLAMP—*Acorn Iron & Supply Co, Delaware Ave & Poplar St, Philadelphia 23, Penna.* Bending post and horizontal clamp for use with welding platens or bending blocks made by the company are available as accessories (Oct 20, p225).



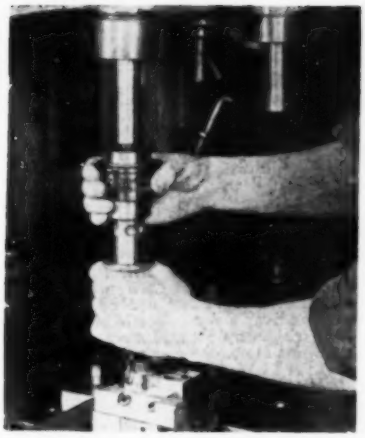
MAGNETIC CHUCK — *Hanchett Magna-Lock Corp, 556 Maple St, Big Rapids, Mich.* Fine-grid magnetic chuck has precision-meshed magnetic poles which are reported to be 37% closer together than in other chucks of this type. The poles are ¾-in. steel separated by ⅛-in. non-magnetic separators of CRP242 hard epoxy resin or Magna-Lock special soft metal. Chucks are available in all sizes (Jan 13, p160).

MAGNETIC CHUCK—*O S Walker Co, Inc, Worcester, Mass.* Permanent magnetic chuck, latest and largest in the company's line, is 12 x 24 in. This No. 1224 has all the features of the earlier models (*AM*—Sep 9 '57, p186) and is entirely suitable for milling and planing (Nov 17, p273).

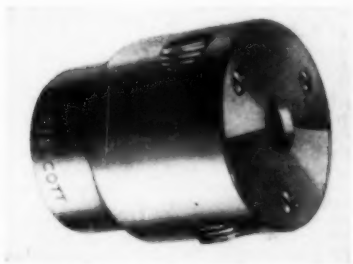
MAGNETIC CHUCK—*DoAll Co, Des Plaines, Ill.* Grinding team consisting of the Selectron automatic chuck control and the Power-Grip magnetic chuck provides variable holding power and a demagnetizing cycle that eliminates all residual magnetism. Chucks and control units are available in a range of sizes for most surface grinding applications in both direct control and remote control models (Aug 25, p110).

MAGNETIC CHUCKS — *Hanchett Magna-Lock Corp, 656 Maple St, Big Rapids, Mich.* Magna Lock permanent rectangular chucks are available with working surfaces of 5⅛ x 10⅛, 6 x 12, 6 x 18 and 8 x 24 in. Their low height, as little as 2 in., provides additional clearance under grinding wheels and cutting tools. An extra magnetic pole increases the workholding area; holding power is increased anywhere from 25 to 75% (May 19, p154).

ELECTROMAGNETIC CHUCK — *O S Walker Co, Inc, Worcester 6 Mass.* Type H is reported to offer superior holding force to accommodate present day feeds and speeds. Because of the symmetry of the design, setup time is said to be minimized. Available in rectangular sizes up to 36 x 120 in., chucks are easily grouped in tandem to make larger installations (Mar 10, p178).



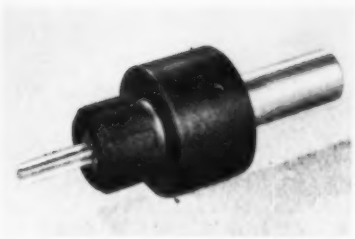
CHUCKS AND COLLETS — *Jones & Lamson Machine Co, Thread Tool Div, Springfield, Vt.* These new, Xtra-Safe, Modern-Magic chucks and collets now feature extra-wide, flange-topped locking rings for hand protection. Collets also have a smoothly flared wide flange which keeps greasy hands from riding up into the chuck. Flange also insures against dropping the collet (Apr 21, p195).



DRILL CHUCK — *Oneida Machine Tool Corp, Oneida, NY.* Two-jaw Westcott model has a capacity of 1 in. The steel cap on the face of the chuck prevents larger drills from being used, and adds strength to chuck body. Hole in hub has been tapered to take an arbor, but it can be bored out and threaded to fit the spindle on which it is to be used (Feb 10, p170).

DRILLPRESS CHUCK—*Pacific Tool & Mfg Co, 7912 SE Powell Blvd, Portland 6, Ore.* Tri-Mark quick-change drillpress chuck permits instant tool changes with the machine in operation. Drills fit into a machined collet which is drawn upward into a seating position on the drill spindle. Fractional, letter, wire size collets up to ½ in., and blank collets are available (Dec 29, p76).

QUICK-CHANGE HOLDERS — *Erickson Tool Co, 34350 Solon Rd, Solon, Ohio.* All standard MMS tapered tools can be used with new holders. Seven models include Morse taper holders for boring mills and radial drills, milling machine holders that fit standard spindle tapers, turret lathe holders, straight shank holders with No. 30 or 40 MMS socket and adapters (Mar 24, p154).

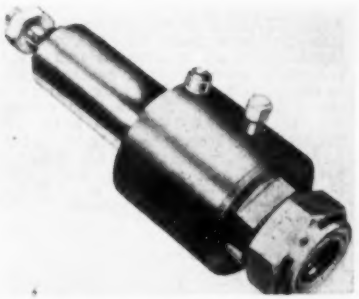


TAP CHUCK—*Universal Engineering Co, Frankenmuth, Mich.* Universal releasing tap chuck requires neither screws nor sleeves; collets are interchangeable with the company's other chucks. It can be used for right- or left-hand tapping without adjustment. A thread die holder, which works on the same self-releasing principle, is also available (Sep 22, p136).

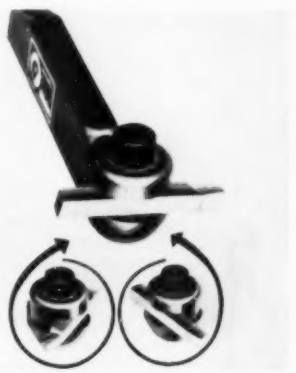
FULLY-AUTOMATIC CHUCK—*American Machine & Foundry, AMF Tool Div, Bloomfield, NJ.* Fully-automatic Wahlstrom chuck turns 95% of lost tool-changing time to productive time. A single chuck reportedly can do the work of several spindles. When the load increases the grip becomes tighter. There is no stopping of the spindle to change tools (Apr 21, p194).

KEYLESS CHUCKS — *Supreme Products Corp, 2222 S Calumet Ave, Chicago 16, Ill.* Keyless chuck is available in two models —both of which fit ¾-24 drill spindles. One is for electric drills; the second, a modification, is for air drills. "Ball bearing screw" principle makes it possible for the mechanic to tighten the chuck by merely turning the barrel with his fingertips (Apr 21, p205).

KEYLESS INDUSTRIAL CHUCK—*Supreme Products Corp, 2222 S Calumet Ave, Chicago 6, Ill.* Precisionist has jaws of chrome-molybdenum alloy steels; runout guaranteed to be minimum. Unit is currently available in ½-in. capacity in tapers No. 2, 6, and 33, and in ⅝-in. capacity with No. 6 taper; ¼ and ⅜-in. capacity units of similar ball bearing construction will be available shortly (Sep 8, p132).



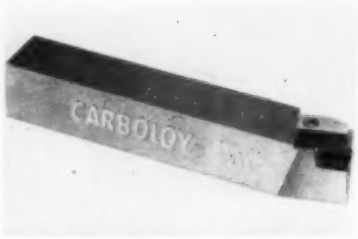
DEEP-HOLE DRILLING TOOLS — *Boyar-Schultz Corp, 2000 South 25th Ave, Broadview, Ill.* Tools are available in four different models to fit all types of multiple-spindle automatic screw machines. Oscillating motion (0.006 in. three times per rev of drill) is derived from a flutter or wave cam built into tool. Unit is driven by the drill speeder spline shaft. This oscillating action breaks chips into fine granules (Jun 16, p130).



UNIVERSAL TOOLHOLDER — *Maxwell Industries, Inc, 493 E Fifth Ave, Ashtabula, Ohio.* Universal-positioning Uni-Max, available in three sizes, 5, 6, or 8 in., holds any 3/16 to ½-in. toolbit or boring bar, round or square, in any horizontal work position. Design provides positioning for carbide tip as well as HSS cutters, eliminating need for special holders for each type (Nov 3, p133).

REAMER HOLDER — *RoyEl Tools, 4221 Excelsior Blvd, Minneapolis 16, Minn.* Self-centering unit is available in two sizes: No. 0 with capacity from 1/16 to 9/32; and No. 00 with capacity from 1/16 to 19/32 of an inch. Master bushing with convex base engages a concave, loose-seating disk. After setup, the setscrews which center the bushing are loosened slightly and bushing is permitted to float (May 5, p169).

TOOLHOLDER—*Distributed by G & D Sales Co, Dillerville Rd, Lancaster, Penna.* Multifix (Swiss) permits setting of a cutting tool at any desired clearance angle. Correct height of cutting edge is easily adjusted by setscrew. Edge may be ground or cleaned without altering adjustment. Tool change is speeded because the unit can be lifted upward without moving lathe carriage. Tools may be clamped in 40 different positions (Jun 30, p116).

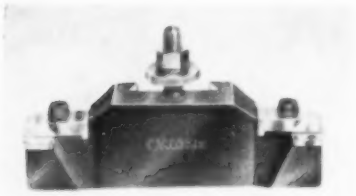


MILLING MACHINE ARBOR—*Imported by A & H von Tsurikov, 755 Lake Ave, Rochester 13, NY.* Germanmade arbor is said to replace six or eight of the conventional type. It consists of a base arbor which always remains in the spindle, and three or four interchangeable centering inserts of different diameters. These inserts completely absorb the axial and radial forces and are clamped from the front (Jun 16, p132).

ADJUSTABLE BORING BAR HOLDER—*Dunham Tool Co, Inc, RFD 4, Danbury, Conn.* Quadrabar has a split eccentric bushing that rotates easily to facilitate boring bar height and center adjustment. The holder accepts $\frac{3}{8}$-, $\frac{1}{2}$-, $\frac{3}{4}$-, and $1\frac{1}{4}$-in.-dia bars. Unit fits all lathes from 8-in. to 18-in. swings. A general-duty unit sells for $59.95; a heavy-duty unit sells for $69.95 (Dec 15, p136).

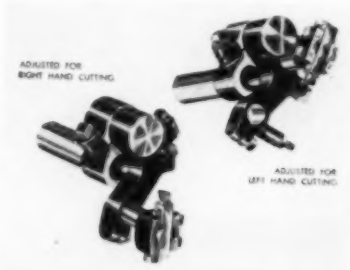
DISPOSABLE-INSERT TOOLHOLDERS—*General Electric Co, Metallurgical Products Dept, Detroit 32, Mich.* Lift-O-Matic toolholders are applicable where tool pressure on workpiece should be kept low, as in tubing, long thin sections, soft gummy materials, soft steels, aluminum or high-temperature superalloys. Toolholders accept triangular inserts $\frac{3}{8}$- to $\frac{1}{2}$-in. inscribed circle, $\frac{1}{8}$ to 3/16 in. thick. Square inserts can also be used (Oct 20, p221).

TOOLHOLDER — *Detroit Reamer & Tool Co, 780 Maple Rd, PO Box 174, Birmingham, Mich.* Design of Wej-Lok eliminates need for use of wrench or screwdriver for locking tools in holders. Simple hand spinning of the retainer ring locks or unlocks inserted RH or LH tools. Normal operating torque tends to further tighten wedging action, preventing wobble (Apr 7, p134).



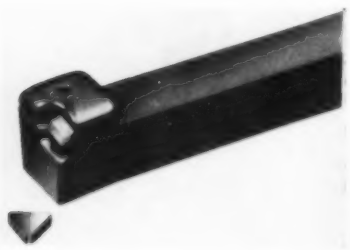
TOOLHOLDERS — *Aloris Tool Co, 419 Getty Ave, Clifton, NJ.* Taree new holders for carbide triangular inserts are: No. 12 for RH turning; No. 14 for LH turning; No. 16 for both RH turning and facing. All are positive rake. Holders are heat treated alloy steel with hardened tool steel replaceable seat. Adjustable chipbreaker clamp speeds indexing (Feb 10, p177).

CUTOFF TOOL HOLDERS—*Portage Double Quick, Inc, 1026 Sweitzer Ave, Akron 11, Ohio.* Holders are available for any cutoff machine, turret lathe, engine lathe or automatic. Wide selection of Manchester line of carbide cutoff tools is designed specifically for each type of machine. V-blade support assures accurate location of the carbide insert. Inserts are always on center and will not lead off during cutting (Dec 1, p149).



TOOLHOLDER—*American Cam Co, Inc, PO Box 2106, Hartford, Conn.* Drill and turning tool holder can be used to add a light turning or facing operation when the turret is full, or to provide a chamfer or sizing turn combined with a drilling or reaming operation. Holder can be used for right- or left-hand turning. Drill head is adjustable for centering drill on work; tool slide is adjustable for length (Sep 8, p150).

SWING TOOL — *R & L Tools, 1825 Bristol St, Philadelphia 40, Penna.* Combination swing tool designed for use on turret lathes and screw machines permits straight, taper, or irregular turning when cross-slide tools are in use for other operations. It can be easily changed for RH or LH cutting. Two high-speed cutting tools are furnished with the unit (Mar 10, p194).



TOOLHOLDER — *Sandvik Steel, Inc, 1702 Nevins Rd, Fair Lawn, NJ.* Coromant T-Max throwaway-type toolholder has a 3-position, spring-lifted chipbreaker that enables the operator to change a carbide cutting edge and change the depth of cut without removing or replacing the chipbreaker. Two or more of these holders can easily be clamped together (Apr 21, p193).

DRILL SLEEVE—*Rick, Inc, 2630 W 12th St, Erie, Penna.* Nylon drill sleeve, called Use-Em-Up, fits over a damaged shank, absorbs galling, and keeps the drill true. If drill is subjected to undue stress, further scoring or breaking is prevented. Nylon sleeve will yield, acting as a cushion between the shank and chuck (Sept 22, p158).

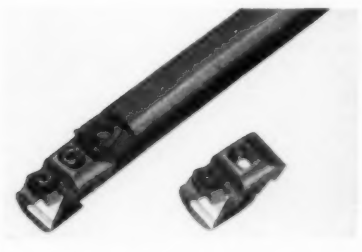
TOOLHOLDERS — *Armstrong Bros Tool Co, 5200 W Armstrong Ave, Chicago 46, Ill.* Positive-rake toolholders have been added to the company's line of carbide insert toolholders. The new toolholders are made in styles for holding triangular or square inserts and in shank sizes for use in conventional toolposts and open-side toolposts. Full range of sizes available (Aug 25, p116).

LATHE HEAD—*Zierden Co, 5817 S Kinnickinnic Ave, Milwaukee 7, Wis.* Zierco triangular-shaped lathe head provides 48 repetitive indexing positions. The 7½° index increment gives all the popular angular positions—the 30° setting of a threading tool and the chamfering angle of 45° can be obtained with the same tool. This head permits full use of both the major and minor cutting edges of tools (Sep 22, p152).

BORING QUILLS — *Wesson Co, 1220 Woodward Heights Blvd, Detroit 20, Mich.* Line of special boring quills uses throwaway carbide inserts. Each quill is designed to combine operations such as boring, spotfacing, counter-boring and turning (May 5, p152).

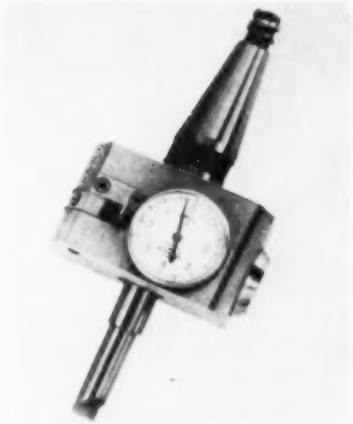
BORING HEAD—*Briney Mfg Co, 1165 Seba Rd, Pontiac, Mich.* Boring head can either finish bore a hole on the withdrawal stroke or retract its toolbit to prevent marking of the finished bored hole as the head is withdrawn. Retraction or feed-out can be handled automatically without interrupting the machine cycle or stopping the machine spindle (Aug 11, p128).

BORING HEAD — *Precision Tool & Mfg Co of Illinois, 1305 S Laramie Ave, Cicero, Ill.* A-1 Miniature Deka-Bore boring head is only 2¼ in. in diameter, 1 15/16 in. long and weighs just 22 oz. Boring head holds quills up to ½ in. dia and permits positive adjustments of 0.0001 in. Offset feature permits adjustments up to ¼ in. on the diameter. Also available is a model without the offset feature (Aug 11, p138).

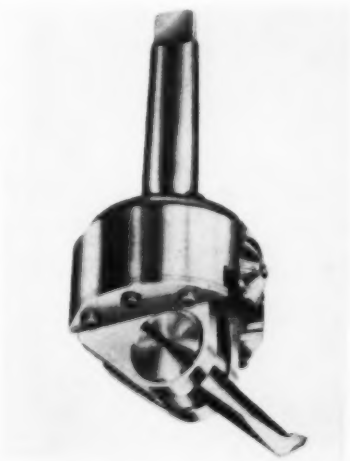


BORING BARS—*Kennametal Inc, Latrobe, Penna.* Boring bars with adjustable and interchangeable heads are available in a complete line, with either solid steel shank (Style BB-3000) or steel core encased in a Kennametal sleeve (Style BB-5000 K-Bars). Bars are available in seven sizes ranging from 1 to 2½ in. dia. All heads accommodate Kendex triangular inserts and chipbreakers (Nov 17, p250).

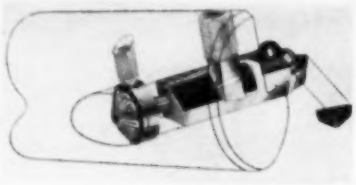
BORING BARS — *Robert H Clark Co, 9330 Santa Monica Blvd, Beverly Hills, Calif.* Finishing and roughing bars are designed to minimize setups. Adjustment and blade exchanges can be made without removing bar from machine. Floating mount permits chip load to balance between the two cutting edges, reportedly producing a far smoother surface on precision finishing operations. Several blade sizes are available for each bar (Mar 10, p172).



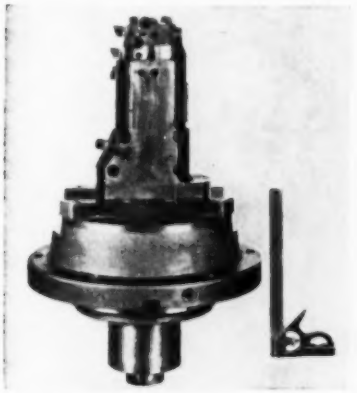
ADJUSTABLE BORING HEAD—*P M Instrument Co, 10 Smith Place, Cambridge 38, Mass.* Micro Dial boring head has built-in dial indicator to make possible direct readings up to 0.0001 in. The boring head can be preset, out of the machine, to any degree of accuracy desired. After initial cut is made and measured, the tool can easily be set, in the machine, to final hole size (Aug 11, p130).



BORING HEAD—*Distributed by Production Equipment Co, Box 82, Glenolden, Penna.* ABC Mark II is a precision tool with an exceptionally wide capacity range. Rough settings are made by swiveling the toolbit. Fine adjustments are handled by a micrometer slide reading to 0.001 in. Range is from ¾ to 5 in. The head is 2¼ in. in dia and 2 in. in length (Oct 20, p222).



BORING UNIT — *Valentine Metals, Div of Valeron Corp, Box 205, Royal Oak, Mich.* Boring unit is micro-adjusted for close dimension control. This unit utilizes throwaway inserts (Apr 21, p194).



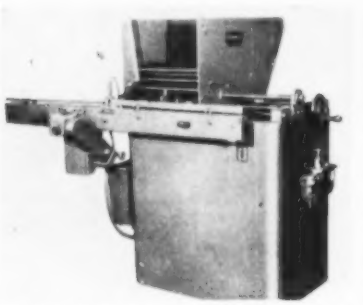
FEED-OUT HEAD — *Gairing Tool Co, Hoover Rd, Detroit 32, Mich.* Designed for original equipment manufacturers to perform intricate machining operations, this head does cross-facing, grooving and undercutting. The tool block feeds out; the counterweight, which is linked to the main bell crank, feeds out in the opposite direction to counterbalance. Tool is 16 in. in diameter and 24 in. long (Apr 21, p200).

TOOLHOLDER BUSHING — *RingO Co, PO Box 863, Dayton 1, Ohio.* Adapter bushing, designed for all types of floating and adjustable toolholders, utilizes split-type construction to clamp entire length of bushing, providing increased gripping power with less screw pressure. Two flat-spring collars on each end maintain bushing alignment and provide spring tension for tool adjustment (Aug 11, p120).

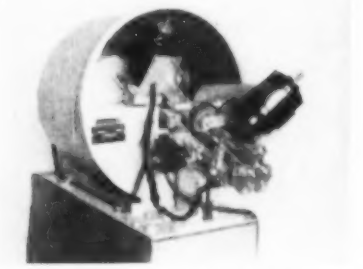
BORING BAR — *Fry Tool Mfg Co, Eaton, Ohio.* Vi-Bra-Damp construction incorporates a cavity within the bar which has been shot-loaded to eliminate all vibration and chatter. Bars and interchangeable tool heads are available in sizes and styles for all boring machines. Positive locking cam permits rapid head changes (Mar 10, p159).

ADJUSTABLE BORING BAR—*Kennametal Inc, Latrobe, Penna.* Adjustable boring bar uses Kendex throwaway turnover inserts. Any diameter between 2¼ and 3¾ in. can be bored. Three heads, each with a half-inch adjustment, cover the entire range. The bar is of heat-treated alloy steel and is designed for a wide range of boring operations (Jul 14, p130).

PARTS FEEDER — *Automation Devices, Inc, 3125 Brandes St, Erie, Penna.* Small size feeder can stack feed "fuzzy" washers or the star-pronged type at rates up to 100 parts per min (for a No. 8 lock washer). Machine, which has a newly developed escapement principle and orientation device, feeds the parts single line into a pin or mandrel and removes them singly from bottom of the magazine (Apr 21, p198).

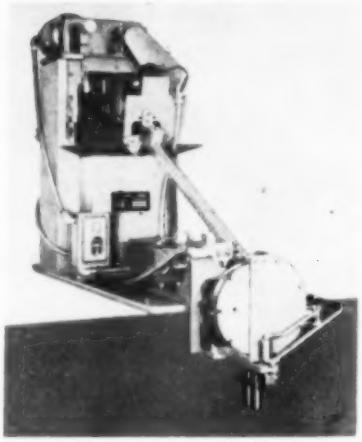


BAR FEEDER — *Feedall, Inc, 38399 Pelton Rd, Willoughby, Ohio.* Model 1700 C automatic bar feeder can be used for bar stock up to 31 in. long and 2 in. in diameter, with belt speed variable from 5 to 20 fpm. Designed to replace hand feeding on centerless grinders, milling machines and many special-operation units, this feeder can be adjusted for any desired feed length from 6 to 31 in. (Aug 11, p124).

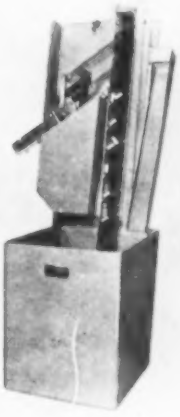


PARTS FEEDER—*US Engineering Co, 40-26½ 22nd St, Long Island City, NY.* Hoppermatic Model R incorporates rollers to feed the product instead of the conventional slide rails; design eliminates jamming of parts in the discharge track. Unit combines the drum of the standard Hoppermatic, which has built-in pick-up pockets, with the driven rollers. Production rates for small screws run in excess of 1000 parts per minute (Nov 17, p246).

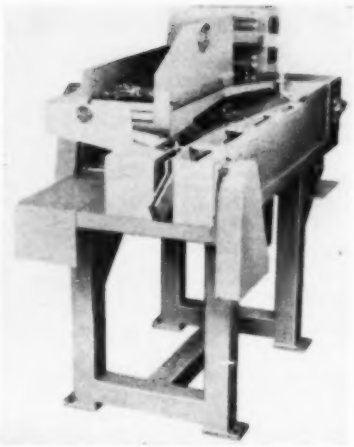
PARTS FEEDER COMPONENTS—*Syntron Co, 311 Lexington Ave, Homer City, Penna.* Parts for Syntron bowl-type feeders are available for anyone who finds it expedient to develop his own parts-handling systems. Components include five drive units and eleven sizes of cast aluminum or fabricated steel bowls. Bowls range from 5 to 26 in. dia; drives are designed to handle entire range (Jun 16, p146).



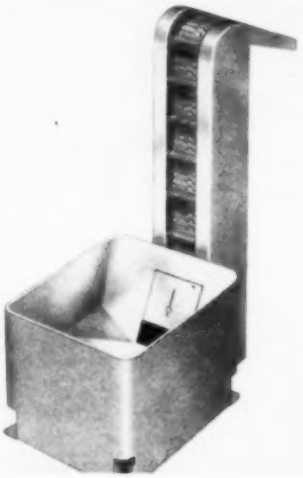
ELEVATING HOPPER — *Production Feeder Corp, 3130 Johnnycake Ridge Rd, Mentor, Ohio* Completely self-contained, the model 5000 bench-type elevating hopper handles a wide range of small-sized metal and non-metal parts. Feeder can be set up to handle rolling forms up to 1 in. dia and ⅝ in. long; sliding forms to ½ in. dia and 1¾ in. long; and headed forms to ½ in. dia and 1¾ in. long (Jun 2, p124).



AUTOMATIC FEEDER—*Feedall, Inc, 38399 Pelton Rd, Willoughby, Ohio.* Completely automatic, the model 2200-C high-speed feeder feeds sliding parts ⅛ to 1 in. in diameter from ½ to 3 in. long, rolling parts ⅜ to 3 in. in diameter from ⅛ to 1 in. in thickness. The 6-cu ft hopper and 6-in.-wide belt offer flexibility for a wide range of parts and provide adequate capacity for volume production (Dec 1, p156).

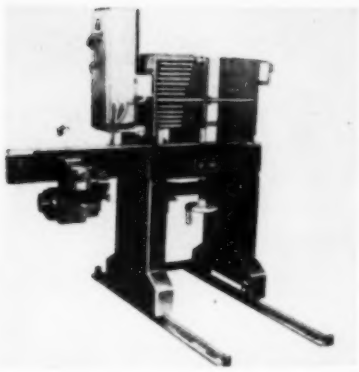


PARTS FEEDER — *Radio Corp of America, Industrial Automation Equipment, 12605 Arnold Ave, Detroit 30, Mich.* Model 330-NM Non-Mar feeder automatically orients and feeds such parts as finished wrist pins, hydraulic valves and plungers, bearings, glass or ceramic insulators, etc, at speeds of up to 30,000 pieces per hr (Nov 3, p133).



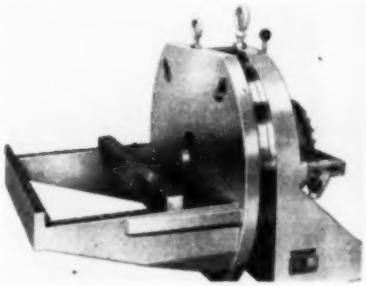
ELEVATING CONVEYOR—*Automation Devices, Inc, VFC Div, Erie, Penna.* Vertical design saves floor space and permits floor-level loading. The result is gentler handling of the parts. Outlet door in the bin is adjustable to control flow of parts to conveyor belt. Hopper capacity is approx 5 cu ft. Bin is made from 3/16-in. plate with a reinforced top ring (Jun 2, p130).

ORIENTING PARTS FEEDER—*Feedall, Inc, 38399 Pelton Rd, Willoughby, Ohio.* Model 2700 Feedall provides fully automatic feed for high speed grinders and special press operations. It orients and feeds both rolling and sliding parts; rolling parts up to 7 in. dia and sliding parts up to 15 in. long. The 25-cu-ft hopper has large capacity for parts accumulation storage and sustained output (Oct 20, p206).



BAR FEEDER — *Production Feeders Corp, 3130 Johnnycake Ridge Rd, Mentor, Ohio.* Self-contained Model 8000 is designed for automatic feeding of long bars or tubing into centerless grinders, polishing machines or heat treating equipment. Adjustable hopper handles parts ¼ to 2¼ in. in dia and 3 to 24 in. in length, permits loading up to 2200 ¼-in.-dia pieces (Jan 13, p162).

PARTS FEEDERS — *Syntron Co, 511 Lexington Ave, Homer City, Penna.* The complete line of bowl-type parts feeders has been redesigned. Increased power and reduced bowl weight permit the use of larger bowls for increased load capacities and faster feeding rates. Feeders are available in the new bowl design models in a range of sizes from 5 to 36 in. dia (Apr 21, p188).



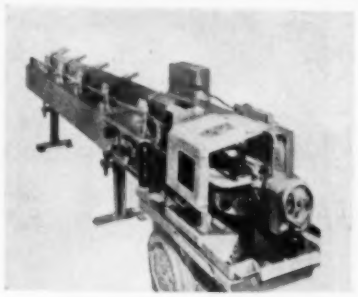
INDEXING TRUNNION — *Johnson & Bassett, Inc, Worcester, Mass.* Model 300 for larger, heavier work loads is particularly suited for heavy-duty radial drills and boring mills. Face plates up to 30 in. in dia may be used; hollow spindle with 2-in. ID can be supplied (Mar 10, p196).

DIVIDING HEAD—*F T Griswold Mfg Co, 315 W Lancaster Ave, Wayne, Penna.* OPL dividing head has built-in indexing accuracy of better than 10 seconds. Points may be relocated and reset as many times as desired to the same accuracy. Direction of spindle rotation can be reversed at any time during indexing. Graduations are subdivided so that extremely close readings, to 2½ seconds, can be obtained directly (Jul 14, p139).

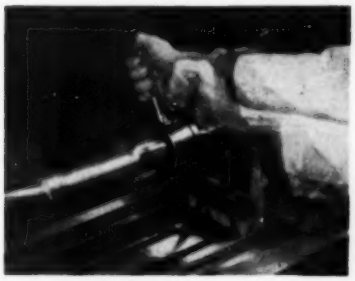
PARTS FEEDER—*Feedall, Inc, 38399 Pelton Rd, Willoughby, Ohio.* Model 2500-C adapts to a wide variety of production machines to form a fully automated unit for high-speed output. Feed range includes sliding parts ¼ to 3 in. dia, 1 to 6 in. long; and rolling parts 1 to 5 in. dia, ⅛ to 1½ in. thick. Automatic cycling controls are available. Hopper has 12-cu-ft capacity (Dec 29, p80).

TUBING LOADER-FEEDER—*Grieder Industries, Inc, Bowling Green, Ohio.* Automatic loader and feeder eliminates manual handling of stock lengths of tubing and round stock. It will hold 15,000 lb of material and automatically feed the entire load through the machine without any attention from the operator (Jul 28, p114).

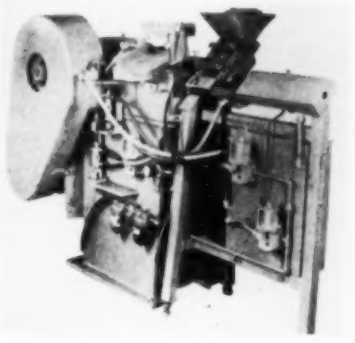
SWAGING MACHINE FEED — *Abbey-Etna Machine Co, Perrysburg, Ohio.* Universal air-draulic feed for swaging machines increases production, provides more uniform shapes, lowers reject rate, and reduces operator fatigue. Operator positions the workpiece on a chuck, and from automatic clamping to finished swaging and table return, the feed is automatic (Feb 24, p151).



BAR FEED — *Lipe-Rollway Corp, 806 Emerson Ave, Syracuse 1, NY.* Automatic magazine-loading unit has an adjustable hydraulic check to control speed of bar stock through stock tube and or machine spindle, regardless of changes in bar weight as piece-part is cut off. Multi-controlled swing-stop permits variations in piece-part length from 3/16 in. to full length of machine's capacity (Apr 21, p210).



INDEXING TOOL — *Detroit Reamer & Tool Co, 780 W Maple Rd, PO Box 174-R, Birmingham, Mich.* Trig-R-Dex offers trouble-free indexing for straight or spiral operations. To index, simply grasp handle, push down on trigger button, move handle until index pin engages next hole, and pull handle to stop position. Both right- and left-hand operations having from one to ten spaces can be indexed (Mar 10, p172).



PARTS LOADER—*Automation Associates, Inc, 1444 East Eleven Mile Rd, Madison Heights, Mich.* This air-operated parts loader and unloader is designed for operation with the company's Model B-2 nigh-speed flaring machine. This device will permit production rates in excess of 2400 double-flares per hour. Unit is designed to handle tubes from 3/16 to ½ in. OD and from 2¼ to 7¼ in. long (Aug 11, p119).

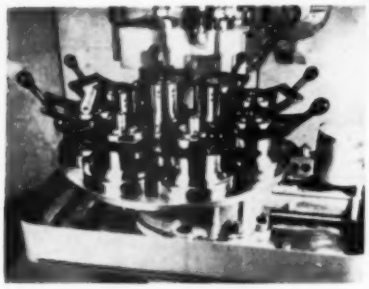
PARTS-HANDLING UNIT—*Michigan Tool Co, Gear-O-Mation Div, 7173 E McNichols Rd, Detroit 12, Mich.* Multifunction parts-handler air-cleans, orients and elevates machined castings such as pump housings. Unit illustrated is designed for inline processing of pump housings and handles 150 8-lb castings an hour. Dimensions, capacity and feed rate are variable to suit particular application (Jan 13, p159).

BAR FEEDS—*Gear Grinding Machine Co, 3901 Christopher, Detroit 11, Mich.* Lipe automatic magazine-loading bar feeds are now available for all Screwmatic 750 machines. Production increases of up to 100% have been reported. Unit holds an 8-hr supply of bars, rods or tubing and is pneumatically controlled, eliminating feed fingers and manual loading (May 19, p162).

OPTICAL DIVIDING HEAD—*Distributed by George Scherr Co, 200 Lafayette St, New York 12, NY.* OMT Model OW12 (English-made) is designed for inspection and light machining purposes. Head may be used with the spindle in the horizontal or vertical plane. Direct readings to 2 sec of arc are accomplished by the use of a micrometer eyepiece. Model OW7, also available, incorporates a scale observed through a fixed eyepiece and reading direct to one minute (Aug 11, p124).

AIR-POWERED INDEXING TABLE —*Mead Specialties Co, Dept TT-P-4, 4114 N Knox Ave, Chicago 41, Ill.* Turretable features a unique method of power transmittal. The rotative force, supplied by air cylinder, is transmitted to turntable without the use of ratchet plates, levers, etc. Standard model will index to 4, 6 or 12 stations (3, 8 or 24 on special order). The index speed at 12 stations is over 3100 indexes per hr (Apr 21, p188).

ROTARY TABLES — *Distributed by Bentley Industrial Corp, 41 E 42nd St, New York 17, NY.* Fully optical 12- and 16-in. rotary and inclinable tables, manufactured by Optical Measuring Tools Ltd, England, read direct to 1 sec of arc for both movements. Tables employ photo-etched lines in conjunction with optical wedge prisms, a fully optical system said to be completely free from wear (Sep 22, p150).



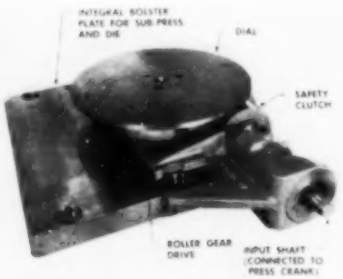
INDEXING UNIT—*Kaufman Mfg Co, Manitowoc, Wis.* Fast-indexing unit, Model 66, with a 330-lb dial, indexes 90° with unusually smooth, shockless operation in 7/10th of a sec. Unit is adjustable for speed and dial load. Pictured are ¾-in.-dia 4-pitch steel parts being tapped two per cycle (May 5, p169).

INDEXING UNIT—*Standard Tool & Mfg Co, 237 Laurel Ave, Kearny, NJ.* Designed for precision positioning between automatic production stations, this cam-operated indexing unit provides 8, 12, 16 or 20 indexes during one turret cycle. Each revolution of the cam shaft rotates the dial plate or index shaft through one index. The unit has high torque rating, and will operate with shaft vertical or horizontal, increasing its versatility (Sep 8, p136).

ROTARY TABLES *Troyke Mfg Co, Cincinnati 41, Ohio.* Redesigned to offer additional features and greater accuracy, these tables are available in six diameters ranging from nine to 25 in. and in eight different models. Features include easy-to-read dials, accurately graduated in 1-min intervals; one-piece wormshafts; enclosed, dustproof base; precision ground turntables (Aug 25, p108).

TURNTABLE POSITIONER — *Aronson Machine Co, Arcade, NY.* Model FT75CS has load capacity of 75,000 lbs, center of gravity location within 12 in. of center of table. Table rotation with 35,000 lb-in. of torque at 2.5 rpm constant speed is provided by a 2-hp brake motor. The 72-in.-dia 8-slot table has 1° increment marks at periphery with indicator to establish degree of rotation (Jun 16, p134).

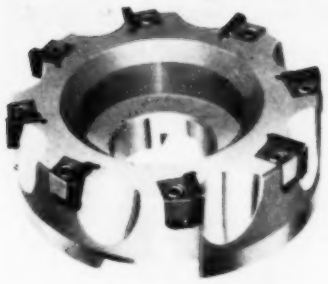
WORKPIECE POSITIONER — *Pandjiris Weldment Co, 5151 Northrup Ave, St Louis 10, Mo.* Unit positions large weldments for drilling and milling operations on large turbine rings, has 6000-lb capacity, is rated at 5-in. overhang, 22-in. eccentricity. Table is 7 ft 4 in. in dia, machined with T-slots. Positioner is designed to withstand a 1000-lb drill force at edge of table (May 19, p182).



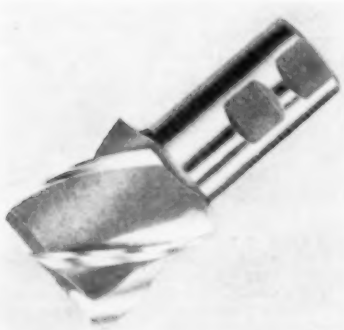
DIAL FEED — *Ferguson Machine Corp, 7818 Maplewood Industrial Court, St Louis 17, Mo.* Designed for OBI presses up to 60 tons, Bolster-Matic dial feed with integral bolster facilitates rapid change of setups. Dial and dies may be removed as a unit or the entire index table with dies and bolster may be detached for die setup at a workbench. Standard feeds are provided with 6 to 16 stations, from 120° to 270° feed times, and rated for speeds up to 200 spm (Aug 25, p103).

STOCK FEED STAND — *Stamping Specialty Co, 2141 N Sherman Drive, Indianapolis 18, Ind.* Type AS stock stands hold a customer-built wood tray at any height or angle for supporting strip stock being fed to a stamping machine. Each stand is adjustable in height from 28 to 42 in., and is inclinable to any desired angle. Stands may be used also in portable conveyor systems and as supports for tables or benches (Dec 1, p158).

UNIVERSAL DIVIDING HEAD — *Greaves Machine Tool Co, 2011 Eastern Ave, Cincinnati 2, Ohio.* Unit provides three-way adjustmeat through two slots in table bracket and double swivel built into quadrant. The pendant-swivel quadrant allows gears of head to swing into position where they can contact gears on leadscrew of any milling machine. The head can be disengaged and used as plain dividing head. Units are available in 10 and 12-in. sizes (Dec 15, p140).



MILLING CUTTERS — *Futurmill, Inc, 6360 Highland Rd, Pontiac, Mich.* Outsize chip gullet in front of blades of Model Z permits depths of cut up to ½ in. with ample chip clearance. Cutters are made with double negative or positive rake angles, depending upon material to be cut. Standard stock sizes range from 2 to 12 in. in dia, use ¾-in.-sq by 3/16-in.-thick throwaway carbide inserts (Jan 13, p164).



MILLING CUTTERS—*Tomkins-Johnson Co, Cutting Tool Div, 617 Mechanics St, Jackson, Mich.* This "E" line of milling cutters is designed for slab milling, die sinking and production milling. They have a high helix angle, double backoff, and a right-hand spiral. Tools are available in sizes from 2 in. dia with 2-in.-long flutes to 2¾ in. dia with 6-in.-long flutes. Setscrew flats on all shanks (Oct 20, p212).

CUTTING TOOLS — *Lovejoy Tool Co, Inc, Springfield, Vt.* Shear-Joy features high positive rake angle and a negative radial rake. Other tools include an indexable throwaway cutter called Joy-Dex which has an adjustable anvil; and an inserted-blade, solid-carbide helical plain mill (Apr 21, p198).

MILLING CUTTER SPACERS—*Dayton Rogers Mfg Co, 2824 13th Ave S, Minneapolis 7, Minn.* Adjustable spacing collars for milling machine cutter arbors are made of hardened and ground alloy steel, and are now available for cutter arbors from ⅞ to 2 in. Adjustment on the smaller collar is 3 32 in.; on the larger, 3 16 in. Price range from $15.30 to $25.35 (Oct 6, p138).

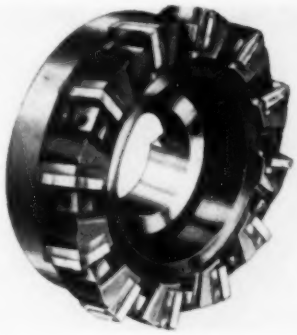
MILLING CUTTERS—*Goddard & Goddard Co, 12280 Burt Rd, Detroit 23, Mich.* Milling cutters, inserted HSS-blade straddle design, are offered for machining aluminum and light alloys. Double keyway permits adjusting tooth position on paired cutters for different thicknesses of materials. Units are furnished with standard diameters from 4 to 16 in. and 1¼ to 2-in. arbor holes (Jun 2, p136).

MILLING CUTTERS — *Brown & Sharpe Mfg Co, Cutting Tool Div, Providence 1, RI.* 134 milling cutters introduced by B&S include four 60° angular cutters; 79 square end (single and double end) end mills; 14 shank-type corner-rounding end mills; and 15 two-flute end mills. Also available are ten Nelco solid-carbide 3-flute side end mills and 12 Nelco carbide-tipped stagger-tooth side milling cutters (Apr 21, p189).

KEYSEAT CUTTERS—*Quality Tool Works, 760 S Market St, Waukegan, Ill.* Woodruff keyseat cutters, designated Quick-Change, permit rapid cutter changes. Cutter shanks are precision ground for length, and butt a positive stop in the cutter holder. Cutters are available in either straight-tooth or stagger-tooth designs. Holders are available to fit most standard milling machines (Sept 22, p157).

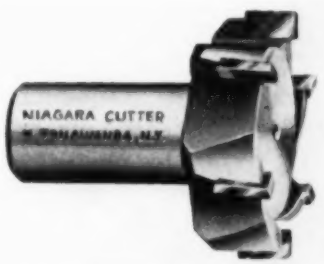
MILLING CUTTERS — *Goddard & Goddard Co, 12280 Burt Rd, Detroit 23, Mich.* Milling cutters for facing aluminum and its alloys have generous-size HSS blades for extending blade life and ample length for deep shoulder cutting operations. Available with either a No. 50 NS drive or a flatback drive for mounting on centering plugs, these cutters are 2 in. wide and are made to order with diameters ranging from 8 to 16 in. (Jun 16, p140).

SLOTTING CUTTERS — *Goddard & Goddard Co, 12280 Burt Rd, Detroit 23, Mich.* Staggered-tooth slotting cutters, Series WAF for general purpose milling, feature flat-face HSS blades held in body by wedges. Two keyways permit cutter interlocking and lining up side teeth on adjacent sides when thin parts are straddle milled. Widths range from ⅜ to 1 in.; diameters from 4 to 16 in. (Mar 24, p168).



MILLING CUTTERS — *Viking Tool Co, 1000 Nichols Rd, PO Box 471, Shelton, Conn.* Inserted-blade shell end mills and face mills, using ½ and ¾-in.-sq throwaway carbide inserts, have double negative rake angles. Hardened HSS anvil is fastened to cutter body by a retaining screw to prevent disassembly during indexing or replacement of insert (Mar 10, p190).

MILLING CUTTERS—*Viking Tool Co, 1000 Nichols Rd, PO Box 471, Shelton, Conn.* Tools use ½- and ¾-in.-square throwaway carbide and HSS inserts. Positive-rake, inserted-blade, shell end mills and face mills feature generous chip room and close blade spacing to provide high feed rates. Replaceable, hardened HSS anvil provides seat for insert (Jun 16, p147).



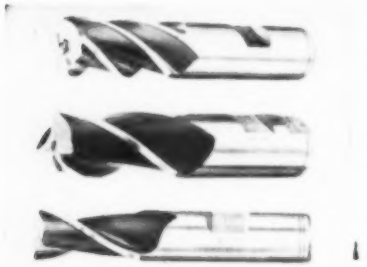
CARBIDE FACE MILLS — *Bollier-Damerell, Inc, Niagara Cutter Div, 130 Niagara St, N Tonawanda, NY.* Units with 3 and 3½-in. diameters with 1¼-in. integral shank, and 4-in. diameters with 2-in. shank have been added to Niagara line. Stubby design brings cutter close to spindle bearings, reducing overhang and strengthening tool support and rigidity so that max capacity of the milling machine can be used (Mar 10, p170).

MILLING CUTTERS—*O K Tool Co, Milford, NH.* Cutter, tradenamed Microcut, has been developed for milling of aluminum and magnesium to tenths, holding a 30 mu-in. finish or better, and is designed to eliminate many grinding and hand-finishing operations. They are available in inserted, wedge, and solid design, including HSS, cast alloys, and carbide (Nov 17, p240).

SPACER—*O K Tool Co, Inc, Milford, NH.* Micrometric spacer is graduated to 0.0005 in. It eliminates shims and washers in straddle milling and is reported to save up to 75% in setup time (May 19, p152).

MILLING CUTTER—*Wesson Co, 1220 Woodward Heights Blvd, Detroit 20, Mich.* Hardened-steel locking wedges placed behind the carbide inserts protect the cutter body in Wesson's new line of throwaway insert milling cutters. Standard, square, solid-carbide inserts give eight cutting edges. Cutters have 7° negative radial and axial rake angles. Complete line is available with 15, 30, 45 and 87° lead angles (Jul 28, p108).

FACING CUTTER — *Nelco Tool Co, Manchester, Conn.* One-piece face mill is primarily designed for use in automation equipment where positive and repetitive location is required. Nelco cutter tips are solid carbide, sandwich brazed to steel body with integral straight steel shank with 45° chamfer. Models are available for cutting alloy steel, mild steel, cast iron and bronze, and aluminum, magnesium, plastics and brass (Feb 10, p156).



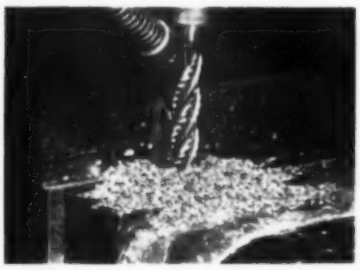
END MILLS—*Illinois Tool Works, Illinite Div, 2501 N Keller Ave, Chicago 39, Ill.* The series 30-40 and 40-50 end mills are made of high cobalt-and-vanadium-alloyed steels. Designed for high speed machining of tough-to-cut, high-strength and heat-resistant metals, both series offer selections of end mill styles and sizes required for cavity milling, slotting, elongating, surface milling, spotfacing and counterboring (Oct 6, p128).

SPIRAL-FLUTED END MILLS — *Atrax Co, 240 Day St, Newington, Conn.* Series 1505 cutters can be run at slower speeds without injury to cutting edge. Sixteen individual end mills are available in series. Features include 4 flutes, single end, straight shank, RH spiral and RH cutting. Fractional sizes range from 1/16-in. cutter diameter to $\frac{3}{4}$-in.; over-all length from $1\frac{1}{2}$ to 4 in. (Feb 24, p184).

CUTTING TOOLS—*O K Tool Co, Inc, Milford, NH.* Cutting tools added to company's line include two-flute, HSS single-end end mills for milling aluminum, and a variety of HSS wedge-type cutters. The latter tools include staggered tooth, half side mills, integral shank end mills, shell end mills and face mills (Jun 16, p144).

PROFILING TOOL—*Kennametal Inc, Latrobe, Penna.* Profiling tool features a two-piece shim designed to eliminate insert shifting. Tool is available in a range of sizes and styles for use with leading makes of profiling machines (Jul 28, p121).

TAPERED END MILLS—*Ed Castor Associates, 93 Oak St, Wyandotte, Mich.* Line of Edco tapered end mills, made from a new tungsten-vanadium steel, is designed for extrusion die, plastic mold, and metal pattern work. Constant spiral from point to large diameter allows tool to cut evenly the full flute length, said to result in smoother wall finish. Complete size ranges from $\frac{1}{2}$ to 10 degrees per side are carried in stock (May 5, p154).



MILLING CUTTERS—*W C Chapman & Sons, Inc, 4705 Erdman Ave, Baltimore 5, Md.* Known as Hob Ground milling cutters, these cutters have been primarily designed for rough milling. The hob grinding process forms the cutting edge into a series of small, individual cutting edges. The cutters produce small or powdered chips. Tooth design permits deeper cuts and heavier feeds, while requiring only half the horsepower of regular cutters (Nov 17, p251).

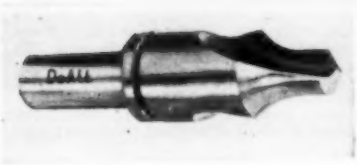
END MILLS—*Turchan Follower Machine Co, PO Box 6055, Dearborn 9, Mich.* 26 assorted end mills ranging from standard to long length and from 2 to 4 flutes, and 32 different tracer tips for flat-end and round-end roughing and finishing are available in a kit (Nov 3, p136).

END MILLS—*Standard Tool Co, 3952 Chester Ave, Cleveland, Ohio.* Solid-carbide end mills, available in single and double-end types, have been added to cutting tool line (May 5, p158).

RADIUS FORM TOOLS — *Lund Mfg Co, 469 Elm St, Biddeford, Me.* Jet-Cut A tools are made from special high speed steel and are recommended for operations requiring toughness and a fine cutting edge. Six styles of concave and convex tools are offered, with radii from 1/32 to 1/16 in. by 64ths, and up to 11/16 in. by 32nds. Tool shank sizes are $\frac{1}{4}$, $\frac{5}{8}$, $\frac{1}{2}$, $\frac{5}{8}$ and $\frac{3}{4}$ in. square. RH and LH cutting tools available (Jan 13, p168).

SHAVING TOOL — *Jersey Mfg Co, 407 Livingston St, Elizabeth, NJ.* Shaving tool, known as Little Shaver, fits the standard circular form tool holder or the back slide on a B&S automatic. Standard model is for long ordinary runs and forms. Special model permits shaving close to the chuck. It is used for forms with unusual differences in diameters (Feb 10, p156).

COOLANT-TYPE DRILL—*Mossberg, Inc, 7824 Hamilton Ave, Cincinnati 31, Ohio.* Known as the Cold Point Drill, this tool is, in effect, a tube into the sides of which flutes have been milled or ground. The end is then slotted to receive a carbide bit or cutting tip, which is then fastened into place. The flutes serve only as channel through which the coolant washes chips. Materials that can be drilled include cast iron, stainless steels, thorium, zirconium, uranium, the new tough alloys, glass, wood, ceramic tile (Dec 15, p131).



DRILL-COUNTERSINK — *DoAll Co, Des Plaines, Ill.* Tool called Counter-Drill saves shop time by combining drilling and countersinking for flat and oval head screws into one operation. It is available in eight sizes thereby assuring the correct body drill diameter and amount of 82° countersink for each individual screw size from No. 5 through ⅜ in. (Apr 21, p200).

GUN DRILLS—*Star Cutter Co, 34500 Grand River Ave, PO Box 376, Farmington, Mich.* Two-flute gun drills, Starbore Center-Cut line, have an enlarged coolant hole in the molded carbide tip that is said to provide a 100% increase in coolant flow to the two cutting edges, thus improving surface finish of produced holes as well as prolonging tool life between grinds (Sep 8, p142).

SPLIT SLEEVES — *Cleveland Twist Drill Co, 1241 E 49th St, Cleveland, Ohio.* Split sleeves, designed for use with straight-shank tanged drills, are offered in four taper sizes—ASA taper shanks No. 1, 2, 3 and 4. They handle the most widely used drill sizes, including fractional sizes 1/16 to 1 in., wire gage sizes No. 1 to No. 52, and letter sizes A to Z (Jun 2, p132).

SPADE DRILLS — *Robert H Clark Co, 9330 Santa Monica Blvd, Beverly Hills, Calif.* Designed to speed cutting of holes in heat-treated alloy steels, stainless steel, titanium and other hard-to-machine metals and castings, these drills are made of new M-3 type HSS. Tools increase production 5 to 8 times when compared with 18-4-1 HSS tools. Drills are available in sizes from 1 1/16 to 5 in. OD (Jan 13, p166).

FLAT SPOT DRILLS — *B & W Precision Products Co, PO Box 3865, Detroit 5, Mich.* Tools are available in two styles—for nonferrous materials and for steel—in large size (¼ x 1½ x 3 in.) to take care of max capacity of 2G B&S screw machines. Stocked also in 90° and 118° included angle drill points, ground either for brass or for steel and with either right or left hand cut (Feb 10, p186).

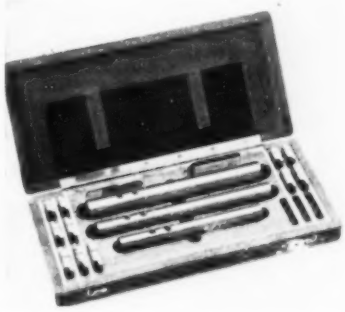
DRILLS — *National Twist Drill & Tool Co, National Square, Rochester, Mich.* Carbide-tipped and solid-carbide twist drills for drilling various types of non-metallic and nonferrous materials are available from stock in all popular styles and sizes (Feb 10, p185).

DEBURRING BIT—*Vernon Devices, Inc, 481 E Third St, Mount Vernon, NY.* 3-fluted Burr-Bit designed to fit 3-fluted taps is available in sizes from No. 6 to ½ in. As tap is withdrawn from the hole, Burr-Bit (slipped on tap) removes the first thread (that creates the burr) leaving a perfectly smooth chamfer. It may be used with friction tapping heads or leadscrews on single or multiple units as well as on hand tapping fixtures (Jul 28, p120).

DEBURRING TOOL—*Universal Engineering Co, Frankenmuth, Mich.* R & R deburring tool has been introduced in two types, each in a full range of sizes to 1½ in. dia. Model 955 uses spring tension against the blade to effect cutting action; Model 956, against the body. Both are adjustable to regulate depth of cut. Replaceable HSS blades are available from stock (Jun 2, p136).

HOLE FINISHING TOOL — *Shearcut Tool Co, 7054 Darby Ave, Reseda, Calif.* Known as Gizmo, tool is reported to produce perfect holes through combined burnishing and compressive action which stresses material being worked beyond its elastic limit as tool is fed into hole. The tool is fed into a previously drilled and reamed hole. Either the part or the tool rotates. Sizes range from 1/16 to 1 in. (Mar 24, p172).

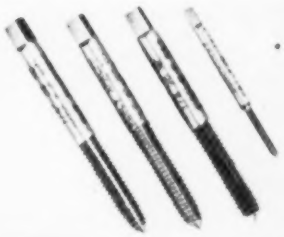
REAMERS — *Fastcut Tool Co, 7405 E Davison, Detroit 11, Mich.* Spiral-fluted HSS chucking reamers are available in sizes from ⅛ to ½ in. dia. and are specially heat treated for maximum wear resistance. The left-hand spiral, right-hand cut keeps the reamer free of chips and allows coolant to reach cutting edges (Feb 24, p171).



REAMER SETS—*Madison Industries Inc, Muskegon, Mich.* Kit 1122 contains three bars and seven cutting heads which can ream any hole from ⅝ to 1 in in dia. Kit 1123 has three bars and 14 heads for reaming holes from 1 to 2 in. in dia. Tool features include micro-adjustability; balanced, floating cutting action; cutter expandability for extensive resharpening allowance. They are made of HSS (Jun 2, p118).

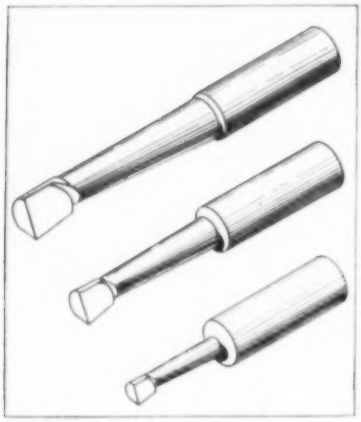
EXPANSION REAMER — *Staples Tool Co, 2352 Glendale-Milford Rd, Cincinnati 15, Ohio.* Carbide-tipped expansion reamer is available in several styles and a range of sizes, has accurately controllable expansion said to be always uniform throughout length of cutting blades. Cutting element is replaceable (Mar 10, p184).

SPIRAL POINT TAP — *Beloit Tool Corp, Beloit, Wis.* Regal Jet tap is available with single or multiple chamfer sections so that an entirely new cutting section, including proper chamfer and spiral point grind, may be obtained without necessity of resharpening equipment or replacing with a new tap. Furnished in machine screw sizes 6, 8, and 10 for shallow hole depth threading (Feb 10, p158).



TAPS — *Besly-Welles Corp, South Beloit, Ill.* The fluteless X-Press tap is designed to cold form or swage threads in ductile materials such as aluminum, zinc, brass, copper, lead, and leaded steel. Standard tools No. 4 through ¼ in. NC, UNC, NF and UNF are provided with taper points for easy starting. Machine screw sizes No. 0 through No. 3 have radial relief only (Feb 10, p150).

BLIND HOLE TAP—*Winter Brothers Co, Rochester, Mich.* Multi Tap for tapping blind holes in materials such as soft aluminum, stainless, magnesium, and some types of copper, is specially treated to increase surface hardness to aid in retarding abrasion encountered in these materials. Stock items are available in No. 6 through 12 in machine screw sizes; ¼ through ¾ in. in fractional (Mar 24, p150).



OFFSET BORING TOOL—*J & L Tool Sales, Box 4612, Mt Elliott Station, Detroit 34, Mich.* Borite boring bar is available in HSS and carbide-tipped styles. The offset taper allows greater portion of bar to enter hole without interference. Smallest tool in line is 2⅝ in. long and is designed for a minimum hole dia of 0.250 in. and a max bore depth of 1⅛ in. Largest model provides a minimum hole dia of 0.750 in. and can bore as deep as 2⅝ in. (Dec 15, p137).

INTERCHANGEABLE COUNTERBORES—*Chicago-Latrobe, 411 W Ontario St, Chicago 10, Ill.* Tools consist of three pieces — high speed cutter, holder, and pilot; cutters and pilots can be quickly interchanged from one size to another. They are available with either straight shank or taper shank holders. Also furnished in sets, with seven different assortments, including 32nd sizes for tool and die shops (Jun 2, p134).

COUNTERSINK TOOL—*Schrillo Aero Tool Engineering Co, 8715 Melrose Ave, Los Angeles 46, Calif.* This fully adjustable micrometer-stop countersink is a lightweight hand tool which may also be used for production work on drill-presses, lathes, millers, or wherever chucking is available. Final cut is accurate within ±0.001-in. limits. Tool is available in sizes from ⅝ to 1½ in. (Nov 3, p132).

BORING BAR — *Maxwell Industries, Inc, Ashtabula, Ohio.* Tool steel boring bars from ½ to 1½ in. in dia are available with four flats and straight or angular square holes. HSS forged bits are also available as standards in sizes from ⅜ to 1-in.-dia shanks with boring capacity starting at ¼ in. (May 19, p171).

COUNTERSINKS — *Atrax Co, 240 Day St, Newington, Conn.* Single-flute, solid-carbide countersinks, Series 1704, are available with included angles of 60°, 82° or 90°, and in three cutter diameters, ½, ¾ and 1 in. Tools sink holes without chatter or tearing, and are recommended for all materials except hardened steels. Countersinking can be done at speeds as low as 150 to 400 rpm (Mar 24, p160).

COUNTERSINKS AND SPOTFACERS—*Craig Tools, Inc, 133 Lomita St, El Segundo, Calif.* Reverse countersinks and spotfacers, formerly available only in high speed steel, are now available in carbide. Carbide-tipped 180-C series countersinks and 190-C spotfacers were developed for machining hard materials. Sizes range from ¼ to 1¼-in. dia, with sizes ¼ through ½ in. made of solid carbide (Dec 15, p145).

HEAVY-DUTY COUNTERBORES—*National Twist Drill & Tool Co, Rochester, Mich.* Tools with either HSS or carbide-tipped cutters feature spline-taper drive. This is said to insure permanent alignment and allow complete interchangeability of pilots, cutters and holders. Wide range of counterboring and countersinking operations are possible. Worn cutters are easily replaced (Jul 14, p134).

BORING BAR — *Wadell Equipment Co, Clark, NJ.* Retrakto boring bars allow boring in one direction and retracting of the cutting edge on the return stroke. This eliminates the common drag line. Production is increased because the tool can be brought back through the bore at rapid traverse rates (Apr 21, p258).

HYDRAULIC PORT CUTTERS — *Sonnet Tool & Mfg Co, 576 N Prairie Ave, Hawthorne, Calif.* Cutters can produce the AND 10050 hydraulic port contour in steels, including stainless. Cutter can also be used in nonferrous materials. Tool produces contour in a single pass and, when reamer pilot is used, also sizes minor diameter of the Class 3 thread specifications. Tools are available in 13 diameters (Jan 13, p162).

THROWAWAY INSERTS—*Firth Sterling Inc, 3113 Forbes St, Pittsburgh 30, Penna.* HSS throwaway inserts stocked in Circle C and Van Chip grades are available for use in positive rake toolholders. They are particularly adaptable for difficult high temperature alloy turning applications. Data sheet available (Jun 16, p166).

INSERT DISPENSER—*Sandvik Steel, Inc, 1702 Nevins Rd, Fair Lawn, NJ.* Device operates on same principle as the well-known razor blade dispensers. It keeps a new insert always at user's fingertips. Scale shows how many inserts are left in dispenser. Device is available for both square and triangular inserts (Apr 21, p193).

DISPOSABLE INSERTS — *General Electric Co, Metallurgical Products Dept, 11177 East Eight Mile Rd, Detroit 32, Mich.* Carboloy grades 78 and 78B are available through the complete line for general-purpose work, with grades 330 and 999 for precision finishing. Of the ten new sizes, nine are precision-ground no-radius so that customer can add his own radius (Nov 3, p138).

THROWAWAY INSERTS—*Newcomer Products, Inc, Latrobe, Penna.* Material, designated NewPro, is available in grade S-35 for cutting steel (corresponding to Carbide Industry Code C-6) and C-35 (C-2) for cutting cast iron and nonferrous materials. NewPro is available in standard sizes and styles of triangular and square throwaway inserts for mechanical toolholders, and in triangular and square throwaway milling cutting blades (May 5, p152).

CERAMIC CUTTING TOOLS—*Marketed by Gulton Industries, Inc, 212 Durham Ave, Metuchen, NJ.* Ceroc ceramic cutting tools (made in France) are reported to cut faster and last longer than comparable ceramic tungsten carbide tools, with an efficiency 4 to 16 times greater. The tools are made without cement or binder materials, giving them greater resistance to brittleness and shearing (Oct 6, p129).

STEEL-CUTTING CARBIDES — *Vascoloy-Ramet Corp, Waukegan, Ill.* V-R 73 is compounded to produce maximum results in the minimum shock range with high resistance to cratering and edge wear. V-R 77 is for applications requiring high resistance to mechanical shock. Both grades are stocked as standards in full-length and throwaway inserts, most standard blanks and popular styles of standard brazed tools (Apr 21, p198).

CUTTING TOOLS — *Carborundum Co, Stupakoff Div, Latrobe, Penna.* Single point cemented-carbide tools, tradenamed Stupalox, are reported to provide an answer to high speed machining where limitations of part, machine, or tool have precluded the use of throwaway tooling. Inserts are cemented to a steel shank with an epoxy resin cement (Apr 21, p287).

TURNING AND FACING TOOL—*Kennametal Inc, Latrobe, Penna.* Style KDG tool uses Kendex throwaway turnover inserts with 80° nose angle. Tool is made in four sizes with separate shims and chipbreakers, eliminating the need for chipbreaker grinding (Jun 16, p140).

THROWAWAY INSERTS — *Maxwell Industries, Inc, 493 Fifth Ave, Ashtabula, Ohio.* Throwaway carbide inserts, square style, have been added to company's line of carbide cutting tools. They are available in 1/16-in. increments from 1⅜ to 6 in. for all standard boring and reaming bars using adjustable cutters (Aug 11, p141).

CEMENTED OXIDE — *General Electric Co, Metallurgical Products Dept, Detroit 32, Mich.* Cemented oxide line includes square, triangular and round disposable inserts and cylindrical blanks. The inserts are designed for nearly all standard toolholders (Apr 21, p254).

CIRCULAR SAWS -- *Louis Levin & Son, Inc, 3610 S Broadway, Los Angeles 7, Calif.* HSS circular saws with extra fine teeth are 30 mm dia (1.118 in.) and have a ¼-in. hole. They are available in thicknesses from 0.10 mm (0.0039 in.) to 1.00 mm (0.0394 in.) by increments of 0.05 mm (Mar 24, p168).

POINTS AND HONES — *Elgin National Watch Co, Abrasives Div, Elgin, Ill.* Diamond mounted points and hones have been added to company's industrial products line. Points come in sizes ranging from 3/32 to 1 in. in diameter and the hones in standard sizes, with specials available. Points are mounted on solid-carbide shanks (Jan 13, p172).

SAWS — *Circular Tool Co, Providence 5, RI.* Deep slitting and cutoff saws are capable of heavier feeds because of the curled chip disposal action. Efficient tooth design is reported to assure longer life. Material is cut square, with filed finish and no burr (Apr 21, p279).

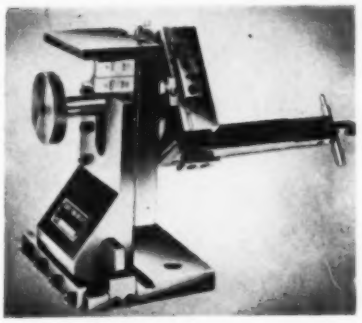
BANDSAW BLADE—*Davies Product Engineering Co, Box 216, Fraser, Mich.* Blade can be taken apart, inserted into an opening in workpiece, and be securely joined in seconds. The holes where the ends join have internal V-grooves used to join the blade. The ends are located in place by inserting soft metal balls into holes and flattening them to band thickness, causing balls to expand and fill V-grooves (Jul 28, p114).

CUTOFF TOOL—*General Machine Co, Inc, Emmaus, Penna.* Non-Flex is designed to eliminate vibration by providing substantial support directly below the cutting edge. Any tip, from HSS through carbide, can be used to its maximum cutting ability. Tool can be quickly reground to produce a new cutting edge. Toolholder prices range from $28.80 to $57; blades prices from $7.70 to $10.60 (Jul 28, p121).

SLITTING AND TRIMMING KNIVES —*Cowles Tool Co, 2086 W 110 St, Cleveland 2, Ohio.* Tungsten-carbide rotary slitting and trimming knives have the extremely hard cutting edges needed to produce straight and true edges, with minimum burr, when slitting or trimming light gage silicon or carbon steels. They are made in two styles: solid tungsten carbide, or with a circular tungsten carbide cutting edge on an alloy steel body (Jun 2, p130).

TOOL SHARPENING — *Dexco Corp, Raymac Div, 15499 Dale Ave, Detroit 23, Mich.* Tool reconditioning service for solid-carbide tools will regrind worn tools and salvage broken or badly chipped tools. Service is also available on a contract scheduled basis. Ordinarily the tools are processed and shipped within 7 to 10 days of receipt at plant; same day service also available (Nov 17, p280).

GRINDING WHEELS — *Simonds Worden White Co, 1101 Negley Pl, Dayton 7, Ohio.* Vitrified grinding wheels, tradenamed Dayton Safety, come in standard sizes from 3 to 42 in. in diameter, with special sizes and shapes produced as required (Mar 24, p168).

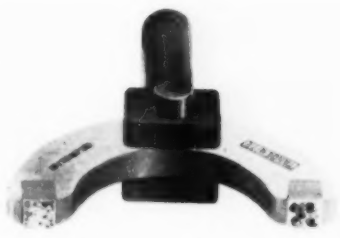


WHEEL DRESSER — *R & A Tool and Engineering Co, 7338 Woodward Ave, Detroit 2, Mich.* Zenith form dresser permits grinding any amount of radii and tangent in one setup without moving the dresser. There is no need for adding or subtracting from pre-arranged sizes; size of the radii corresponds exactly with the gage blocks used (Dec 1, p156).

DIAMOND ABRASIVE TOOLS—*Carborundum Co, Bonded Abrasives Div, Niagara Falls, NY.* Latest additions to company's line of abrasives tools are man-made-diamond abrasive wheels and hones. Designated MD, the resin-bond wheels are available in 100 and finer grits and in 25, 50, 75 and 100 concentration. Metal and vitrified bond MD wheels are made in selected concentrations in same range of grit sizes (May 19, p151).

DIAMOND WHEELS—*Elgin National Watch Co, Abrasives Div, Elgin, Ill.* Diamond wheels, latest additions to company's line of diamond tools, are expected to have wide application among carbide fabricators and regrinders, and in the ceramic field for slicing silicon and germanium wafers for transistors. Wheels range in size from ¼ in. to 43 in. and are available with resinoid, metal or vitrified bond (Aug 11, p141).

DRESSING TOOL — *American Coldset Corp, US Highway 46, Teterboro, NJ.* Known as the Wafer, this tool contains an oriented diamond which is cut to dress the wheel for which it is intended perfectly with no resetting or turning (Apr 21, p205).



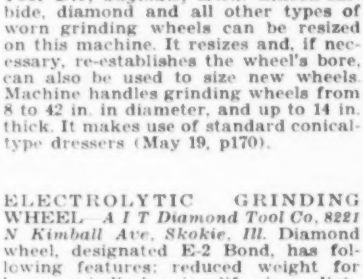
WHEEL DRESSING TOOL — *Tandemite, PO Box 4736, Cleveland 26, Ohio.* Tandemite tool is designed to dress both sides of a wheel, as well as the face, to an accurate 90° shoulder. Yoke ends are available with diamond cluster at one end and diamond filter pad at the other to provide a following device to sweep the surface (Feb 10, p158).

GRINDING WHEEL CHUCK—*Lindgren & Sons Machine Inc, Chicopee Row, Groton, Mass.* Designed to facilitate interchange of cylindrical grinding wheels on surface grinders, the Universal chuck automatically centers grinding wheel with spindle as jaws of chuck tighten against grinding wheel, which is always in balance. Chuck is available in sizes to accommodate all standard wheels from 6 in. to 20 in. dia (Sep 8, p132).

GRINDING WHEEL — *Nu-Matic Grinders Inc, 8224 Carnegie Ave, Cleveland 3, Ohio.* Expanding grinding wheel Model 004, added to Flexcore line, is 4 in. in dia and offers complete flexibility of width selection up to 8 in. New extruded aluminum core design, in addition to providing considerable weight saving, facilitates the custom sizing of the individual wheels to meet specific use requirements (Oct 20, p225).

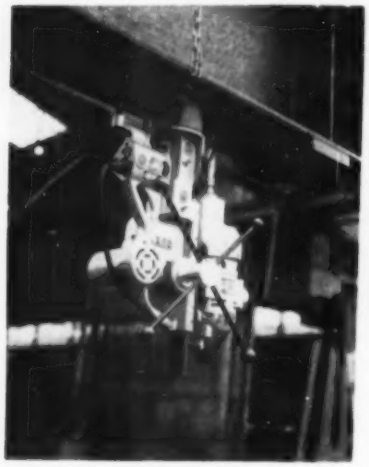
GRINDING WHEEL SALVAGING MACHINES—*Wickes Corp, Machine Tool Div, Saginaw, Mich.* Silicon-carbide, diamond and all other types of worn grinding wheels can be resized on this machine. It resizes and, if necessary, re-establishes the wheel's bore, can also be used to size new wheels. Machine handles grinding wheels from 8 to 42 in. in diameter, and up to 14 in. thick. It makes use of standard conical-type dressers (May 19, p170).

ELECTROLYTIC GRINDING WHEEL—*A I T Diamond Tool Co, 8221 N Kimball Ave, Skokie, Ill.* Diamond wheel, designated E-2 Bond, has following features: reduced weight for longer spindle bearing life; immediate start with no break-in time necessary; longer life; faster stock removal; new design to increase coolant flow to point of contact (Jul 14, p132).



CARBIDE-TOOL SHARPENING KIT —*Penn Scientific Products Co, Abington, Penna.* Kit contains a 6-in. magnetic chuck ready for mounting; single layer diamond grinding wheel ring; diamond ring lap attachment; 5-gram tube of diamond lapping compound; roller; 4-oz bottle of diamond lapping oil; 4-oz bottle of thinner; atomizer; and Pensco diamond wheel dressing stick (Oct 6, p142).

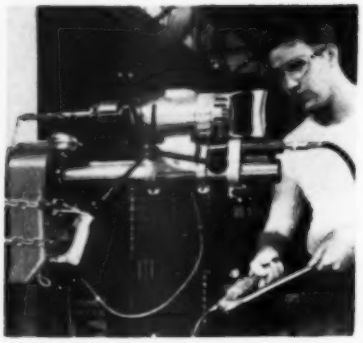
GRINDING WHEELS—*Simonds Abrasive Co, Tacony & Fraley Sts, Philadelphia 37, Penna.* Man-made-diamond grinding wheels are reported to offer increases of up to 35% in grinding efficiency. Wheels are available in a complete line of all standard sizes and shapes, diamond depths, concentrations, and grain and grade specifications in both resinoid and vitrified bonded styles (Sep 8, p152).



PORTABLE MAGNETIC DRILLPRESS — *Buck Mfg Co, 1355 N 10th St, PO Box 692, San Jose 12, Calif.* Bux-Matic has a positive, automatic power feed and two-speed control. All makes and sizes of portable drills—both air-operated and electric — can be easily adapted to the new Bux-Matic by use of Bux adapters. Unit is capable of drilling up to 1⅝-in. holes in any position (Apr 21, p191).

MAGNETIC DRILLPRESSES—*Thor Power Tool Co, 175 N State St, Aurora, Ill.* All three models feature a swivel column with lock, permitting accurate location of work after the magnetic press is clamped in place. Model 2MAG handles ⅝-in.-capacity electric and 1-in.-capacity air drills and weighs 35 lb. Model 3MAG, 48 lb, accepts 1¼-in. electric and 1⅝-in. air drills. Model 4MAG, 52 lb, accepts 1¼-in. electric and 2-in. air drills (Sep 22, p150).

ELECTRO-MAGNETIC DRILLPRESS — *Portomag, Inc, 1511 East Nine Mile Rd, Ferndale 20, Mich.* Bantamsize, lightweight portable drillpress called Mighty-Midget weighs 20 lb and stands 9¼ in. high. Particularly adaptable for use on tool setup work, dies, jigs and fixtures, special machinery, plumbing and electrical jobs, maintenance and repair work, it will drill up to ⅝-in. and tap 5/16-in. holes (Feb 24, p154).



MAGNETIC DRILLPRESS—*Black & Decker Manufacturing Co, Towson 4, Md.* This ¾-in. unit drills holes within 1/64-in. accuracy in continuous operation on either ac or dc current. Magnetic base is detachable from the drilling unit. Drilling or tapping capacity is 13/16 in. in steel, reaming capacities up to ⅝ in. Drill stroke is 12 in. Magnetic pull is 1850 lb (Jul 16, p126).

PORTABLE PNEUMATIC GRINDERS—*Thomas C Wilson, Inc, 21-11 44th Ave, Long Island City 1, NY.* Tool line includes horizontal grinders with speeds of 3200 to 12,000 rpm and suitable for wheels from 3 to 8 in. dia, and high-speed die grinders with speeds of either 40,000 or 60,000 rpm. The die grinders also take a wide range of wheels (Dec 29, p78).

PNEUMATIC DIE GRINDER — *Dodden Tool Corp, Sherwood, Ohio.* Dotco 1AE for contour finishing of dies, molds, and patterns can be used for finishing hard-to-reach areas because of its angle-drive design, compactness, and small size. Unit can be used with flexible disk holder with contour sanding disks up to 4 in. in dia, carbide burs, or with mounted wheels (Mar 10, p178).

PNEUMATIC TOOL — *Doeden Tool Corp, Sherwood, Ohio.* Dotco Model 2GL for grinding, burring, and finishing operations is cool-running up to 25,000 rpm. Heavy-duty, rotary-vane type unit is equipped with Erickson 200 series collets as standard, and can accept ⅜-in. shanks of larger wheels, burrs, and sanding disks. Tool has over-all length of 5⅝ in., weighs 1 lb 5 oz (Jul 28, p121).

AIR HAMMER—*Thor Power Tool Co, Prudential Plaza, Chicago 1, Ill.* Air hammer, designed for drilling in concrete, brick, plaster and other masonry, sucks in the drilling dust and collects it in special dust-extracting tanks. Designated No. 15-DL, the tool is a modification of the company's No. 15 utility air hammer. It accepts bits from ⅞ through 1⅜ in. (Aug 11, p143).

NOISELESS AIR TOOLS — *Aro Equipment Corp, Bryan, Ohio.* Portable power tools feature noiseless, blastless exhaust. Initial models include light-duty and medium-duty drills, screwdrivers and tappers. Exhaust air is routed back through a system roughly parallel to inlet system, and escapes at a point adjacent to air inlet. Porous bronze diffuser located at outlet deadens any remaining exhaust noise. There is no loss in power (Feb 24, p150).

HEAVY-DUTY AIR HAMMER—*Superior Pneumatic Mfg Co, Inc, 4758 Warner Rd, Cleveland 25, Ohio.* Model SP500 is designed for heavy cutting, chipping, chiseling or grooving. It is 9½ in. long and weighs 4 lb. Metering trigger controls blows from zero to 2200 blows per min. Safety chuck holds tools securely. Air consumption is only 11 cfm at 90 psi. Price, with one chisel, is $109.50 (Sep 8, p148).

AIR-POWERED DEBURRING TOOL — *Ellison Engineering Co, 5530 San Fernando Rd, Glendale 4, Calif.* Miniaturized air-powered tool, designated AirBurr, for deburring, drilling, grinding and polishing, rotates at speeds up to 150,000 rpm and operates on 15 to 100 psi air. Only 13/16 in. across the corners of the head, tool accepts standard ⅛-in.-shaft tools. Price is $24.50 (Feb 24, p161).

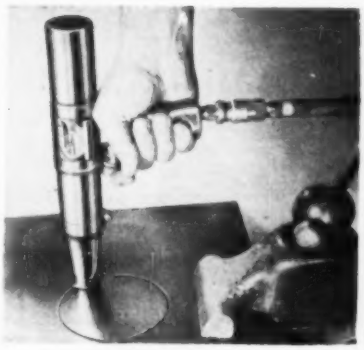
AIR-HYDRAULIC POWER PACK — *Chicago Pneumatic Tool Co, 6 East 44 St, New York 17, NY.* Portable Pneudraulic Power Unit, CP-895-ARDR, powers hydraulic tools. It operates on 90-psi shop air pressure, converting this to 7000-psi oil pressure. Max volume of high-pressure oil is 2 qt per cycle (Apr 21, p180).

PNEUMATIC SANDER—*Airetool Mfg Co, Springfield, Ohio.* Model 500-V vertical pneumatic sander has been specially designed for fine metal finishing and feather-edge sanding. Tool can be provided with motors operating at speeds of 2000, 3000 or 4000 rpm. Entire unit weighs only 4 lb 10 oz and may be used with a 5-in. or 7-in. sanding disk (Aug 25, p106).

PORTABLE PNEUMATIC TOOLS—*Gardner-Denver Co, Quincy, Ill.* Series of Keller air tools, designed for drilling or assembly operations in close quarters, includes the 12L-2 screwdriver, the 16L-2 nutsetter, and the 11L-2 angle drill. Tools weigh 2¼ to 3⅜ lb. Each tool is available in five sizes with speeds ranging from 3200 rpm for the smallest sizes to 450 rpm for the largest (Dec 1, p142).

PNEUMATIC TOOLS—*Ingersoll-Rand Co, 11 Broadway, New York 4, NY.* Models added to line include 5081T Impactool for accurate torque control in the 50 to 150 ft-lb range, and the 5081 Impactool for nut-running jobs up to ⅝-in. bolt size. The 5081T runs at 1350 rpm and will deliver 2000 impacts per minute at 90-psi air pressure. The 5081, without torque control, runs at 2000 rpm and, when impacting, delivers 2000 impacts per minute at 90-psi air pressure (Oct 6, p129).

AIR HAMMER — *Superior Pneumatic & Mfg Inc, 4758 Warner Rd, Cleveland 25, Ohio.* Bantam Bully Model SP-2-900B has straight handle for one-hand operation in close-quarter or blind-spot work. It can be suspended from overhead reels. Tool measures 7¼ in. long, weighs 20 oz, uses 6.5 cfm of air. Metering trigger permits control of blows from 0 to 13,000 per min. Price is $52.50 (Mar 24, p160).



PNEUMATIC SAW — *Air-Speed Tool Co, 1502 W Slauson Ave, Los Angeles, Calif.* Portable pneumatic power saw and file is designed for rapid keyhole, deadend, and scroll cutting on plastic materials. Operating speed and cutting stroke are easily adjusted (Jan 13, p164).

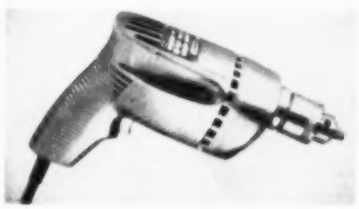
PNEUMATIC DIE GRINDER—*Airetool Mfg Co, Springfield, Ohio.* Model 500 extra-heavy-duty grinder is designed for precision and production grinding, finishing and deburring work on large dies, molds or patterns. The air-driven motor runs at 17,000 rpm on an air pressure of 90-100 psi. Tool weighs 3 lb and has a 3-in. wheel capacity. Over-all length is 14½ in., collet capacity is for either ¼ or ⅜ in. (Aug 11, p126).

AUTOMATIC DRILL — *Buckeye Tools Corp, Springboro Pike, Dayton, Ohio.* Buckeye-Matic portable automatic drill goes through the entire drilling cycle, including retraction and stopping, automatically. Rated capacity is 1½ in. in steel, greater in aluminum and softer materials; max stroke of 6 in. can be adjusted by a micrometer screw. Mechanical feed insures forward progress as long as drill rotates (Apr 7, p136).

IMPACT WRENCH — *Reed Roller Bit Co, Cleco Div PO Box 2119, Houston 1, Texas.* Model A-30-SA is designed to deliver more power than previous models. Tool is offered with ½-in.-square shank or Integral Quick Change Chuck, and with 3- and 6-in. spindle extensions, all having ⅜-in. bolt capacity and 5/16-in. tapping capacity (Feb 10, p169).

TUBE ROLLER — *Airetool Mfg Co, Springfield, Ohio.* Pneumatic instrument controls tube expansion in manufacture of heat exchanger equipment by accurate measurement of torque. It can roll up to 12 tubes per min. Accurate to within 0.001 in., the Airetrol automatically stops expansion according to a predetermined setting. Three models are available, for tube sizes ranging from ¼ to 1½ in. OD (Mar 24, p160).

NUT RUNNER—*Iseman Corp, Engineering Div, Eleventh & Dakota, Sioux Falls, SD.* Nelson nut runner is designed for running and torquing screws and nuts in the low torque range from 6 to 40 oz-in. It is air powered and weighs less than one pound. A nut can be run and torqued in one-half second. The speed-controlled spindle turns eight times with each trigger action (Jul 2, p126).



PORTABLE POWER TOOLS—*Stanley Electric Tools, Div of Stanley Works, 111 Elm St, New Britain, Conn.* New line includes two ¼-in. heavy-duty drills, two ⅜ in. heavy-duty drills, one ¼-in. standard-duty drill (and drill kit) and six heavy-duty impact-type power drivers. Drills range in speed from 800 rpm (¾-in.) to 2000 and 25,000 rpm (¼-in.). The impact-type drives comes in all speeds—from 600 to 2000 rpm for all driving needs (Jun 2, p122).

PORTABLE NIBBLER—*Fenway Machine Co, 3107 N Broad St, Philadelphia, Penna.* This nibbler, available in both air-powered and electric models, cuts all types of corrugated metals without clogging, even those with asbestos or pitch coatings. Tool is made in five models and can be vise mounted for bench work or used as a portable tool, as it weighs but 13 lb (Oct 20, p193).

TOOL CLUTCH — *Buckeye Tools Corp, 5023 Springboro Pike, Dayton 39, Ohio.* One-Shot clutch designed for company's line of fastening tools stops tool the instant predetermined torque is reached. Clutch jaws remain disengaged as long as tool touches workpiece; when tool is removed from work, clutch resets for next fastening operation (Apr 21, p285).

PORTABLE BROACH PULLER — *Chicago Pneumatic Tool Co, 6 East 44 St, New York 17, NY.* Portable broach puller permits on-the-spot broaching of basic drilled or punched holes to square, oval, splined, notched or irregular shapes. In a single pass, round holes are finished to tolerances of ± 0.0002 in. (Apr 21, p190).

PORTABLE ROUTER — *Onsrud Machine Works, Inc, Portable Tool Div, 3900 Palmer St, Chicago 47, Ill.* Model V-222, designed for all types of heavy-duty routing of nonferrous metals, laminated materials, and wood, incorporates pushbutton selection of power drive. At low position, router motor operates at ½ hp at 40,000 rpm; at high position, 1 hp at 50,000 rpm. Companion unit, the W-221 is also available providing a single power 40,000-rpm, ½-hp drive (May 5, p166).

ELECTRIC IMPACT WRENCH — *Millers Falls Co, Greenfield, Mass.* Model 777, with rated capacity for running and removing nuts on bolts up to ⅝ in. (⅝ in. under favorable conditions), has ½-in.-square drive, produces 2000 impacts per min, develops 100 ft-lb torque. Weight is 7¼ lbs. Price is $99.50 for wrench alone; $128 for complete kit with carrying case, sockets and other accessories (Feb 24, p170).

IMPACT WRENCH CHUCK—*Supreme Products Corp, 2222 S Calumet Ave, Chicago 16, Ill.* Device converts an impact wrench into a heavy-duty drill. Chuck fits all ½-in. square drive tool and holds ¼-in. to ½-in. drills. It features a keyless gripping action and is rugged enough to withstand the shock created by impact power tools (Nov 17, p261).

HEX WRENCH—*Ridge Tool Co, Elyria, Ohio.* Wrench has an adjustable four-sided jaw. Narrow jaws facilitate work in tight places. Three sizes are available: No. 11 for ¾ to ¾ in., No. 17 for ⅝ to 1¼ in. and No. 25 for nuts from 1 to 2 in. (Oct 20, p229).

PORTABLE BENDER — *Shaf Mfg Corp, 1020 Germantown Ave, Philadelphia 23, Penna.* Mighty Midget is a hand tool for bending metal into almost any shape or form. Powerful enough to bend ¼-in. CRS, tool exerts up to 2000-lb pressure to form metals against its interchangeable curve and angle dies. Price is $4.95 (Aug 11, p146).

SCREWDRIVER BIT HOLDER — *Magna Driver Corp, 779 Washington St, Buffalo 3, NY.* Device operates by compressing a tiny neoprene ring to hold firmly all types of insert bits frictionally. Unit is available on all Magna-Tip magnetic bit holders for ¼ and 5/16-in. hexagon insert bits for all models of recessed head screws (Feb 10, p174).

HAMMER FACES—*Nicholson File Co, Providence 1, RI.* Hammer faces are replaceable and interchangeable on company's Soft-Faced and Dead-Blo industrial hammers. Faces come in seven different hardnesses. Other hammers in the line include solid-head, demountable-head with rawhide or nylon faces, and rawhide mallets (May 19, p176).

GEARED HEAD WRENCH—*The X-4 Corp, Box 1158, West Acton, Mass.* Model TD-1500 is rated at 4000 ft-lb with a 1-in. input drive and 1½-in. output drive. New line of large socket wrenches has sockets made by a special process; they can be produced from 1½ in. to 8 in. or larger without special tooling and in increments of a few thousandths of an inch if necessary (Sep 22, p160).

TORQUE TOOL—*Mülbar Corp, Cleveland, Ohio.* Pre-set torque tool is available in a wide range of torque settings. One end fits square drive of standard sockets, other end fits square drive of ratchet or hand wrench. When threaded fastener being tightened has been drawn up to predetermined torque, release mechanism permits slight free rotation, which is a signal that max torque has been reached (Jun 2, p136).

RATCHETS—*Owatonna Tool Co, 383 Cedar St, Owatonna, Minn.* Reversible ratchets with small, compact heads and simple shift lever are easy to use in tight places. Tools are available in drive end sizes of ¼, ⅜, ½ and ¾ in. (Oct 6, p134).

HAND-OPERATED DRIVERS—*Scully-Jones and Co, 1901 S Rockwell St, Chicago, Ill.* Safe-Torque drives are preset for a given torque by engaging the internal adjusting screw with a socket head wrench, turning it clockwise to increase torque and counterclockwise to decrease torque. Three models are available. Ranges are: 0-60 in.-lb, 0-25 in.-lb, and 0-96 in.-oz (Aug 25, p103).

IMPACT WRENCH—*Swenson Engineering, PO Box 43, Branford, Conn.* Hand-operated Model 1000 delivers torque values up to 15 times that applied by the operator to the handle, making it possible for one man to easily tighten or loosen bolts up to 1¾-in. dia. Model has two drive extensions that fit standard 1-in. square sockets. It is 26½ in. over-all, weighs 22 lbs (Jun 30, p120).

PLASTIC HAMMERS—*Hunter Tool, Box 564, Whittier, Calif.* No-Mar hammers are available with "screw-in" replaceable tips. Tips are standardized in three grades: No. 1, a soft (red) plastic tip; No. 2, a hard (green) plastic tip; and No. 3, a very hard nylon (cream) tip. Hammers range from 5 oz to 2 lb (Nov 17, p255).

BALL PEEN HAMMER — *Stanley Tools, Div of Stanley Works, 111 Elm St, New Britain, Conn.* Tool is designed to minimize chipping of critical areas and assure safety for the user. It is treated on the chamfer by induction heat treatment to produce a lower degree of hardness on the rim. The polished Model 316 ranges in weight from 4 oz to 40 oz and is priced at $2.95 to $4.30. The black-finish models sell for $2.35 to $3.75 (Jan 13, p168).

MARKING MACHINE — *Defiance Machine & Tool Co, 1920 S Vandeventer Ave, St Louis 10, Mo.* Wire and tube marking machine, Model EMW-1, is operated through an electric keyboard. The wire or metal tubing is fed from coil stock and passes between guides beneath the marking station. As desired information is typed, material is automatically fed into machine and spaced, giving clear, clean marks. Depth or pressure necessary to mark material is adjustable (Mar 24, p170).

ROLL MARKING MACHINE — *Noble & Westbrook Mfg Co, East Hartford, Conn.* Recipromark 490 is equipped with two air-control units, one for the worktable, the other for an index table. Each includes filter, pressure regulator, gage, and lubricator. Depth of mark is achieved by varying marking pressure and number of marking strokes (Mar 10, p174).

MARKING MACHINE — *Jas H Matthews & Co, Inc, 3942 Forbes St, Pittsburgh 13, Penna.* Inline offset printing unit incorporates three individual type wheels holding either identical or different data, for printing one, two or three steel bands simultaneously. Printer is friction driven by the material passing on the production line so that printing speed always corresponds to line speed (Apr 21, p276).

MARKING MACHINE — *Acromark Co, 7-13 Morrell St, Elizabeth, NJ.* Floor-type Model 9AP gets its operating power from plant air line. Open design of back and offset front permits marking of continuous strip, rod, bars. Mouth opening is 14 in. without fixtures; adjustment is every 2 in. Width of opening is 15 in. Over-all height is 4 ft 4 in., placing marking dies at proper position for hand feeding or production line flow (Jul 14, p136).

MARKING STAMPS—*M E Cunningham Co, 1062 Chateau St, Pittsburgh 33, Penna.* Stress-Less line of steel stamps with round faces has been designed for use in marking parts subjected to vibration, where stresses from sharp-faced markings are common. Stamps are available in 11 sizes from 1/16 to ¼ in. in nine and ten-piece figure sets and 26 and 27-piece letter sets, in either Gothic or Roman type faces (Aug 25, p116).

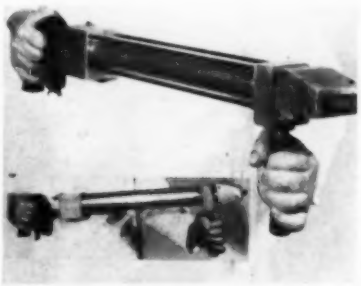
NAMEPLATE MARKER — *Jas H Matthews & Co, 3704 Forbes Ave, Pittsburgh 13, Penna.* Model 222 is a pneumatically operated machine for marking on pre-formed nameplates. Interchangeable marking type is contained in an inner chase which nests the nameplate. As master chase is moved into the machine head, a microswitch automatically actuates the pressure roll beneath the chase, impressing the type into all blank panels of plate in one stroke (Jul 16, p136).

HEAVY-DUTY MARKER—*Markem Machine Co, Keene 78, NH.* Large imprints on flat surfaces or objects such as circular saw blades and similar products, can be made at production rates by the Model 103A machine. Unit will mark a max imprint area of 9 in. front-to-back by 11 in. left-to-right on objects up to 1½ in. thick. Specifications include throat clearance of 14½ in. from center of 9-in. print area (Oct 20, p216).

AUTOMATIC NUMBERING HEAD — *Noble & Westbrook Mfg Co, East Hartford, Conn.* Model 484 is designed for roll marking a 20-digit number into flat pieces with a permanent indented impression in a curved line. Automatic indexing after each stroke is accomplished by a 1¼-in.-bore air cylinder. Head is equipped for manual indexing of all wheels, including those which are also indexed automatically by the air tripper (Feb 24, p184).

ELECTRO-ENGRAVING UNIT — *Electromark Corp, 293 E 19 St, Cleveland 15, Ohio.* Model E-500 is a large power unit designed to mark many things that heretofore could not be marked by this electrochemical process (Apr 21, p267).

MARKING MACHINE — *Jas H Matthews & Co, Inc, 3942 Forbes St, Pittsburgh 13, Penna.* Airgrit blast-etch marking machine handles a wide variety of long or short cylindrical parts. Unit uses four Airgrit nozzles to produce a mark on a wide arc of the circumference of the parts in one operation. Blast-etch principle allows distortion-free marking on extremely hard or delicate surfaces without damage to the part (Apr 21, p262).



PORTABLE PNEUMATIC MARKER — *Pannier Corp, 104 Sandusky St, Pittsburgh 12, Penna.* Style C marker, designed for hot and cold metal marking assures accurate single-impact impressions. Unit is two feet long, weighs only 14 to 16 lb, including head and type, and is easily carried about on the end of an air hose. Three styles are available (Aug 11, p121).

INDUSTRIAL OFFSET PRINTER — *Jas H Matthews & Co, 3704 Forbes St, Pittsburgh 13, Penna.* No. 248 offset printer, designed to provide continuous lineal printing on steel, aluminum or plastic pipe, bars, tubing or similar products, mounts directly over a moving production line and is capable of printing on an unlimited range of product sizes from ½ in. OD. Printing speeds up to 1000 fpm are possible (Mar 24, p164).

MARKING MACHINE — *Jas H Matthews & Co, Inc, 3942 Forbes St, Pittsburgh 13, Penna.* Model 240 Hydra-Pneumatic general-purpose marking machine provides a highly flexible means of marking on a great variety of flat, round or contoured surface products. Other machines include Model 201 rotary table marking machine designed for high-speed marking on a variety of cylindrical or cone-shaped parts, either solid or tubular (Apr 21, p191).

MINIATURE LUBRICATION SYSTEM — *Stewart-Warner Corp, Alemite Div, 1826 Diversey Pkwy, Chicago 14, Ill.* Low pressure positive displacement, miniature lubrication system, designated Accumite, is designed for use on machine tools. System can handle a wide range of lubricants of the lighter grades. Four different types of lubricant pumps are available. They deliver enough lubricant to serve from 40 to 200 bearings per stroke (Feb 24, p180).

AUTOMATIC LUBRICATION SYSTEMS—*Lincoln Engineering Co, 5703-27 Natural Bridge Ave, St Louis 20, Mo.* Electro-Luber systems are designed to supply oil or grease to banks of injectors in a centralized lubrication system. The 65-lb pumps, which can be mounted in less than ½ sq ft of space, are available in two models, 1000 and 2900-psi max pressure. System lubricates up to 1000 bearings in seconds (Oct 20, p236).

LUBRICANT TESTER — *Hohman Plating & Mfg Co, 814 Vermont Ave, Dayton 4, Ohio.* The A-6 solid lubricant tester can be used for simulation of wear, heat, and atmospheric conditions usually encountered by such products. Instrument can also be used for the wear or friction testing of many plastics and fibrous materials, as well as oils and greases (Aug 25, p116).

COOLANT UNIT—*Madison Industries, Inc, Muskegon, Mich.* High pressure coolant unit for use in gun drilling operations is available in four models with output range from 7.7 to 35 gpm at 1000 psi. Tank capacities range from 55 gal to 150 gal. All models have pressure adjustable from 0 to 1000 psi (Jul 14, p130).

COOLANT SUPPLY — *Cardwell Machine Co, Franklin & 19th St, Richmond 11, Va.* Coolant supply system, designed for deep hole drilling (gun drills) and trepanning, is being manufactured in three standard sizes: 7.5, 22.5, 37.5 gpm with pressures up to 1000 psi. Unit guarantees removal of all particles larger than 5 microns (Jun 16, p152).

CLARIFIER — *Delpark Div, Indiana Commercial Filters Corp, Dept C-287, Lebanon, Ind.* Gravity clarification unit removes metallic chips and abrasive particles from cutting and grinding oils and water-base coolants. Retention time is 7 to 9 minutes. No filters are used; removal is by gravity alone. Flow capacities range from 20 to 1000 gpm, with tank capacities from 140 to 7600 gal (Nov 3, p133).

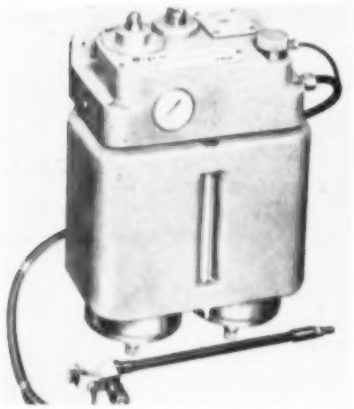
MIST COOLANT GENERATOR—*Kett Tool Co, 5055 Madison Rd, Cincinnati 27, Ohio.* Unit is available in 1-gal size with one or two mist outlets and a 4-gal size with 1, 2, 3, or 4 outlets. Portable unit operates an any air line, requires no special coolants (Nov 3, p133).

CENTRIFUGE—*A M Lavin Machine Works, Hatboro, Penna.* This centrifuge is designed for grinding, honing, lapping, polishing and cutting machines. It is ideal for coolant clarifying, liquid processing, and particle separation. Centrifuge is available in two models. No. 510 has a capacity of 150 gal per hr and is priced at $275; No. 515, 1000 gal per hr, sells for $375 (Oct 6, p137).

AERATOR COOLANT NOZZLE—*Universal Metal Hose Co, 2133 S Kedzie Ave, Chicago 23, Ill.* Full-Flo is furnished assembled to a flexible, wire-braided armor hose that may be bent to any desired position for lubricating or cooling of work. A ⅜-in.-NPT solid male coupling is furnished on machine end of assembly. Assemblies are supplied in 9, 12, and 15-in. over-all lengths (Jun 16, p155).

LUBE PUMP—*Force-Flo Inc, Box 2442, East Cleveland 2, Ohio.* Lubri-Flo pump for lubrication of machinery and equipment is made to fit 25-, 35-lb and 5-gal pails, and makes it possible to apply lubricants in any consistency from the original container to point of application without need for a hand grease gun. Lubricants within the NLGI range 0, 1, 2, 3, 4, 5 are easily dispensed under all weather conditions (Jul 14, p136).

COOLANT SPRAYER—*DeVilbiss Co, 300 Phillips Ave, Toledo 1, Ohio.* Multi-Mister, for cooling and lubricating forming and cutting tools, supplies mist of coolant liquids or light cutting oils at point of contact between tool and material. Equipment consists of one or more adjustable-tip spray nozzles and brackets for mounting; flexible tubing to carry air and coolant to each nozzle; and supply tank (Jun 16, p144).



COOLANT EQUIPMENT — *Bijur Lubricating Corp, 151 W Passaic St, Rochelle Park, NJ.* Spraymist unit contains air filter, trap, regulator and gage, solenoid valve and conduit box, pressurized coolant reservoir and filter. Solenoid valve starts Spraymist when machine is turned on. The 1-gal-capacity unit is used on most production equipment; it is also available in an 18-oz-capacity model (Mar 10, p176).

MIST COOLANT SYSTEM — *Black Diamond Saw & Machine Works, 119 North Ave, Natick, Mass.* Spraymist system is available as a separate package for mounting on all existing Black Diamond and Worcester drill grinders, or as an optional extra on new models. System includes the unit, extension tube, jet and dual hose; requires only a standard connection to shop air supply (Jul 28, p121).

MIST COLLECTOR—*Torit Mfg Co, St Paul 2, Minn.* Model MC-412, designed to control mists from wet machining operations, measures 22 in. square, 47¼ in. high, and can be floor-mounted on legs or mounted on walls or ceiling. Spun glass filters can be replaced. Performance ratings under standard test conditions are 632 cfm; velocity, 4650; external static pressure, 2.15 in. wg with a 5-in. inlet (Oct 20, p232).

FILTER AND DRAGOUT CONVEYOR—*Lundholm Mfg Co, 1121 Charles St, Rockford, Ill.* Features of Liquid Filter include a continuous or intermittent clean coolant automatic backwash. Filtering medium consists of tubular screen rotating at the same speed as conveyor system. Unit will handle water, water soluble, and oil coolants. Sizes range from 10 gpm and up (Nov 3, p131).

COOLANT SEPARATORS — *Inflico Inc, PO Box 5033, Tucson, Ariz.* Magnetic coolant and cutting oil separators are designed for grinding, honing, lapping, thread grinding, and other ferrous metalworking operations. Maximum capacity is 150 gpm. Both metallic and non-metallic solids are removed through a combination of magnetic and mechanical separation (May 19, p154).

BACTERIAL INHIBITOR—*Eli Lilly & Co, 740 S Alabama St, Indianapolis 6, Ind.* Elcide 75 will extend the life of soluble oil emulsions at least two to four times. It is effective in all standard duty emulsions and preliminary studies indicate that it is also effective in protecting synthetic coolants. Recommended use is one ounce in four gallons of fresh emulsion (Oct 6, p137).

HEAVY-DUTY CUTTING FLUID — *United Laboratories, Inc, 302 U B Bldg, Huntington, Ind.* Tap-Cut 35, for ferrous and nonferrous metals, is reported to act in a heat limiting capacity on low and medium tensile steels to keep interface temperatures below the critical point to greatly retard tool wear. Compound can be brushed on in concentrated form, or can be used in less critical service in concentrations as low as one part to 2 parts oil (Sep 22, p157).

TAPPING FLUID — *Termite Drills, Inc, 99 N Lotus Ave, Pasadena, Calif.* Rapid Tap, in addition to increasing the efficiency of tapping operations, is effective in reaming, drilling, boring, threading, lathe cutoff, and profile milling. It can be used on all metals and alloys, is non-flammable, non-explosive. Product is available in 4-oz cans with switch spout; also available in pint cans (Aug 25, p115).

CUTTING FLUIDS — *United Tool Co, 303 U B Bldg, Huntington, Ind.* Organic compounds perform a dual role as cutting fluid agents — they speed metal removal and extend tool life. In addition, the fluids also react chemically to release atomic chlorine at temperatures of 270 to 500 F, and sulphur monochloride beginning at 375 F, resulting in a stressing or brittlizing action that reduces plastic flow (Apr 21, p262).

CUTTING FLUID KIT — *Philip M Stinson, Inc, 8774 Grinnell, Detroit 13, Mich.* Test kit makes it possible to spot test various types and mixtures of coolants on the job. Kit contains beaker, stirring spoon, 16-oz bottle of Stinson X-32 cutting fluid and a 16-oz bottle of X-50 soluble oil concentrate. Bottles are the plastic squeeze-type and have jet nozzles to simulate machine flow of fluid directly on work (Mar 24, 172).

CUTTING COMPOUND — *Commonwealth Engineering Co, Dayton, Ohio.* Cutting compound, said to have extremely high film strength and exceptional heat conductivity, also provides a long-lasting protective coating over the machined surface. Combining liquids with metallic solids, compound can be used in standard coolant piping and pumping systems of machine tools (Oct 20, p234).

DIE LUBRICANT — *Lubricants, Inc, 16170 James Couzens Highway, Detroit 21, Mich.* Die Lube Stick is used to fill scratches or scoring left on the surface of the dies after grinding to prevent metal pickup or galling. Pickup is unlikely to occur again in the same area. Material is applied to the affected area without removing dies. It withstands high temperatures, and is reported to have excellent lubricating qualities (Jun 2, p136).

SOLID FILM LUBRICANT—*Hohman Plating & Mfg Co, 814 Vermont Ave, Dayton 4, Ohio.* Suf-Kote M-1284 containing molybdenum disulfide eliminates galling and seizing under extreme pressures and temperatures, and is inert to unusual atmospheres. Manufacturer claims that it will also speed up parts assembly, prevent fretting corrosion, and facilitate break-in-lubrication of engine parts (Jul 28, p120).

ANTI-STICKING AGENT—*Perc E Harms Co, 1815 Harding Rd, Northfield, Ill.* Material, called Slide, is an aerosol spray incorporating high silicone content. Low surface tension permits it to spread out for thorough lubrication of intricate mechanisms. Product is odorless, colorless, nonstaining, and non-toxic (Oct 6, p128).

DRILLING LUBRICANT—*Protective Coatings, Inc, Box 3985, Detroit 27, Mich.* Drill & Tap Lube is reported to provide superior performance in drilling, tapping and reaming all metals. Prices range from $12 for one dozen 8-oz bottles to $5 a gallon in 30-gal lots (Jul 14, p128).

TITANIUM FORMING LUBRICANT —*EverLube Corp, 6940 Farmdale Ave, North Hollywood, Calif.* T-50 is said to reduce galling and permit lower die temperatures. Materials can be sprayed or brushed, and air dried. After forming, the product is easily removed with solvents (Jul 14, p130).

THREAD-GAGE LUBRICANT — *Protective Coatings, Inc, Box 3985, Detroit 27, Mich.* Micronoil Gage-Lube is guaranteed to give 100% longer service from close tolerance gages. It is non-gumming, non-loading, providing easier and faster gaging. Prices range from $15 for one dozen 4-oz bottles to $112.50 for a 5-gal lot (Jul 28, p116).

THREAD LUBRICANT—*Parker-Hannifin Corp, Fittings & Hose Div, 17325 Euclid Ave, Cleveland 12, Ohio.* Ferulube is a leaded grease developed to prevent galling of threaded parts. It is recommended for reducing wrench torque in the make-up of bite-type tube fittings. Product is packaged in a one-pound can (Oct 20, p238).

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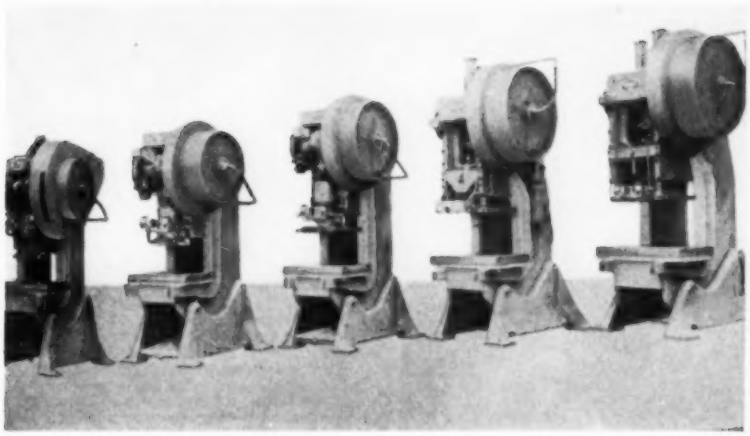
METAL FORMING AND CASTING



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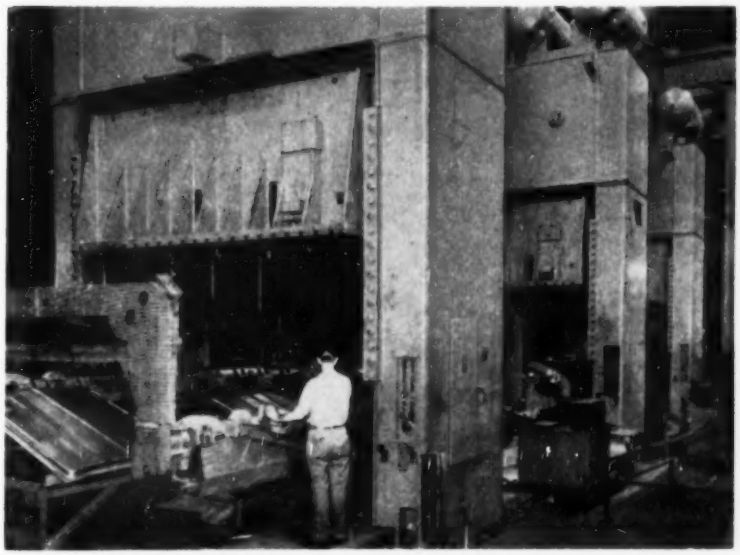
OBI PRESSES—*Danly Machine Specialties, Inc, 2100 S Laramie Ave, Chicago 50, Ill.* This complete line features the Danly low-inertia air-friction clutch. This design results in less wear because of the low number of parts and low weight to be picked up on clutch engagement. The brake is also air operated and spring set. Presses range from 25 to 200 tons (Aug 25, p102).

150-TON PRESS—*ACCO Equipment Div, American Chain & Cable Co, Inc, York, Penna.* Electrically operated motorized press is available with various sized motors and pumps. Equipped with a 7½-hp drive, press has a ram speed of 11 ipm at no load and 7½ ipm at full load. Standard ram stroke is 8 in. Over-all height is 90¼ in., width between uprights is 48 in. The horizontal travel of the head is 18 in. and the table travel is 24 in. (Oct 20, p198).

ELECTRONIC PRESS DRIVE—*E W Bliss Co, Press Div, Canton, Ohio.* Accutrol drive permits reverse jogging of press without stopping and reversing the motor. It is possible to back away at once and save considerable time when setting large dies. Bottoming dies may be brought together with an easy reverse jog and pulled out sharply by normal jog. Normal clutching and braking are controlled by a servo system which electronically compensates for thermal and kinetic variations (May 19, p148).

PUNCHPRESS—*Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* Series 40 5-ton press has standard stroke of 1 in.; other stroke lengths up to 2 in. are available at small additional cost. With ram up, max shut height is 8 in. A 1-in. adjustment is available in the ram, and ram is drilled for a 1-in. punch shank diameter. Bed measures 6 x 8 in. with 3¼-in. clearance from center of slide to frame. Over-all height is 21 in. Price is $189.60 (Sep 22, p133).

MECHANICAL PRESS — *E W Bliss Co, Canton, Ohio.* Line of single-point, double-action, enclosed toggle presses incorporates all the latest in-building features. Ranging from 200 to 2000 tons in capacity, presses are of welded construction, using a four-piece frame with tierods. Press is equipped with control outlets for automatic feeding, unloading and transfer devices (Mar 10, p162).



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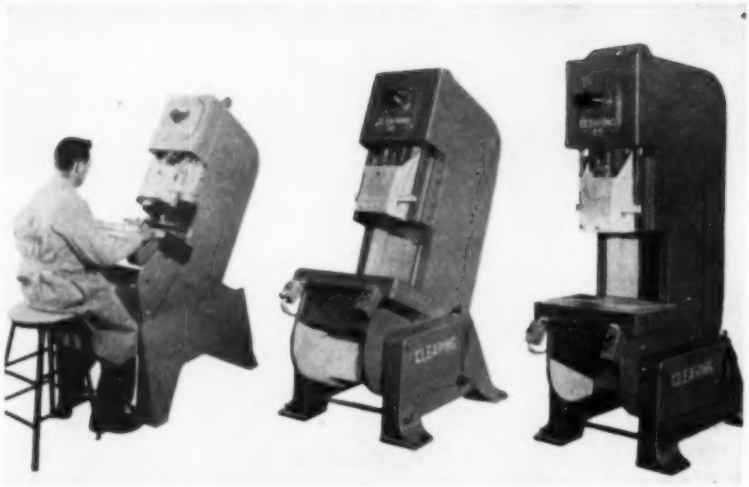
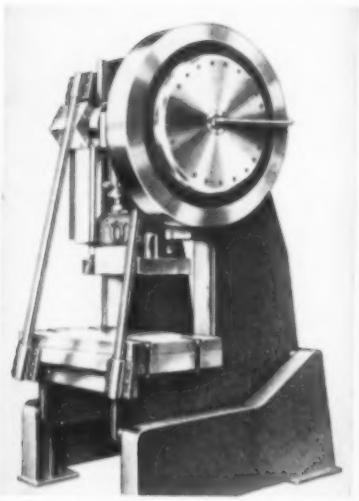
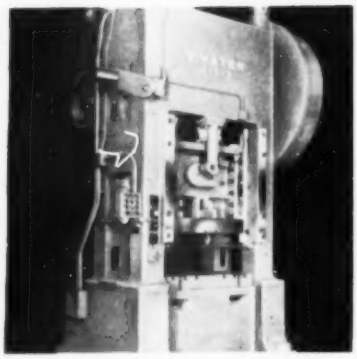
MECHANICAL PRESSES—*Niagara Machine & Tool Works, 683 Northland Ave, Buffalo 11, NY.* Series SE straight-side, eccentric-geared presses handle a variety of large, heavy-tonnage drawing, punching and blanking work. Produced with one-, two- and four-point suspension, in increased capacities now ranging from 100 through 1250 tons, the line includes 130 models. All can be readily modified and equipped for automation (Oct 6, p130).

OBI PRESSES — *Clearing Machine Corp, Div of U S Industries, Inc, 6499 W 65 St, Chicago 38, Ill.* Torc-Pac OBI's are available in capacities of 22, 32 and 45 tons. An air-friction clutch and brake is standard equipment. Integral drive unit consists of all working members of the drive and slide. Prices start at $1395 for a ready-to-run 22-ton press (Jun 30, p109).





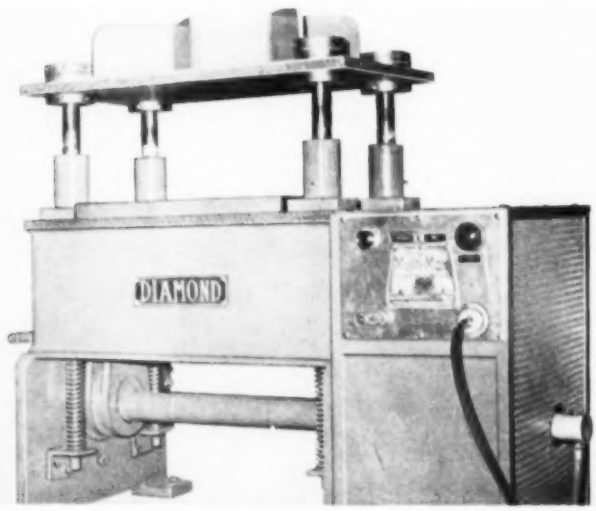
PRESS — *Emhart Mfg Co, V & O Press Div, Hudson, NY.* 60-ton press, latest addition to company's T-Line series, has a welded steel frame, is built to JIC standards, and offers a 4-in. stroke operating at 150 spm. Slide is made with detachable head so that changes from standard to flanged slide face can be made without refitting slide ways. Inclining mechanism can be operated either by hand or air power (Apr 21, p199).



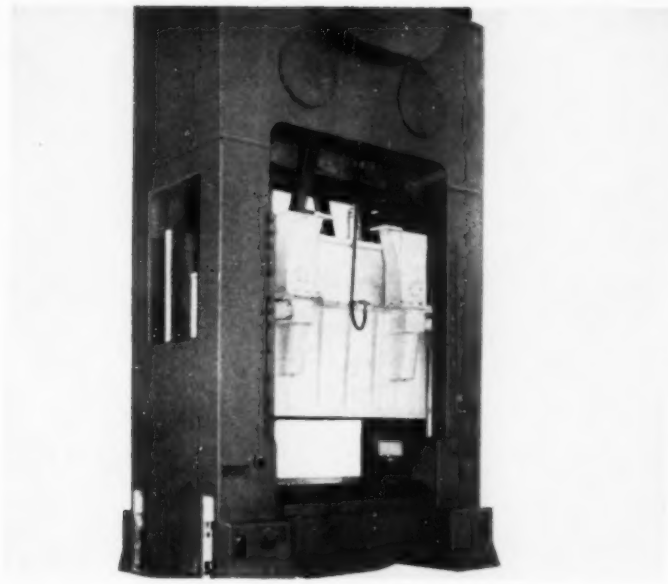
BLANKING PRESS — *Minster Machine Co, Minster, Ohio.* Model 40E-9 heavy duty 400-ton blanker is a straight side press designed for blanking high shear strength material up to ½ in. thick. Standard unit is a single-geared, single-end-drive press that operates at speeds from 35 to 120 spm, depending upon length of stroke (Mar 10, p162).

HORIZONTAL PRESS—*Sales Service Machine Tool Co, Press-Rite Div, 2563 University Ave, St Paul 14, Minn.* This new horizontal mounting of the 30-ton Prese-Rite OBI press is reported to simplify the ejection of lightweight pieces stamped at high speed. Fabricated steel base provides solid mounting. The motor mount is built onto the base and is provided with a screw adjustment for belt tension (Jul 28, p101).

PUNCHPRESS—*Alva Allen Industries, 1001-15 North 3rd St, Clinton, Mo.* Model BT-12, 12-ton capacity, has large die space with 5-in. throat and 7-in. shut height. Standard stroke is 1¾ in., with special strokes of ¼ to 3 in. available at additional charge. Unit with standard stroke is priced at $437.50 for the floor model, and $410 for bench model (Jun 30, p116).



PUNCHPRESS — *Diamond Machine Tool Corp, 5111 Coffman-Pico Rd, Pico, Calif.* Accessible for manual or automatic feed from any or all four sides, this 4-post, 20-ton Multi Max punchpress is ideal for assembly line work, or as an integral stamping station in an automatic stamping line. Model shown has 1½-in. stroke, speed of 350 spm, a 10-in. die shut height, 2-in. ram adjustment, bed and ram size of 20 x 24 in. (Jun 16, p132).

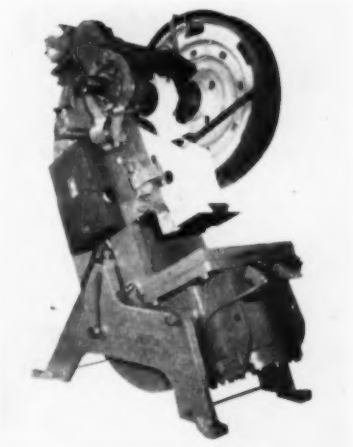


DOUBLE-ACTION PRESSES — *E W Bliss, Press Div, 1375 Raff Rd, SW, Canton, Ohio.* Line of enclosed straight-side double-action presses operates at high speeds yet maintains draw speed of 75 fpm. Available in capacities from 300 to 1600 tons, they are offered in JIC sizes from 72 x 48 in. A variety of press drives is available, including the quill type "K" combination clutch and brake, the modified type "F" clutch and brake, and the company's electronic press drive (May 19, p152).

DIE TRYOUT PRESS—*Alpha Press & Machine, Inc, 9281 Freeland Ave, Detroit 28, Mich.* 300-ton mechanical die tryout press has a slide that rotates up to 270° from its normal position, permitting full accessibility to the die. The die can be tried and a production run made in the same machine. Specifications include a slide stroke of 8 in.; a shut height of 36 in.; motorized slide adjustment, 12 in.; bed area, 84 x 48 in.; 10 to 30 strokes per min (Aug 25, p104).

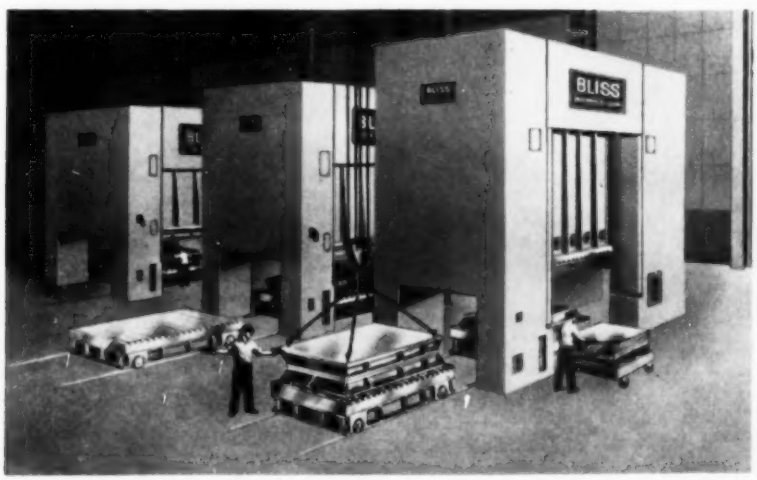
MINIATURE PUNCHPRESS — *Magnetec Corp, 11785 W Olympic Blvd, Los Angeles 64, Calif.* Mini-Line press, designed for instrument work, fine punching, staking or forming operations, has a controlled ¾-in. stroke and can be operated from both sides, either RH or LH, as well as forward or back by resetting the two-position handle. Accessories include a set of 10 round punches in sizes from 0.020 to ¼-in., pedal kit, die set, and an eyelet set (Feb 24, p173).

DEEP THROAT PRESSES — *E W Bliss Co, Press Div, Canton, Ohio.* Line of deep-throat presses, designed for high speed punching, cutting and forming on large, wide sheets, includes two bench models of 4- and 7-ton capacities and six floor models ranging in capacity from 10 to 60 tons. Throat depth varies from 12 in. on the smallest bench model to 34 in. on the largest floor model (Apr 7, p132).



MULTIPLE-PRESS LINE — *Kenco Mfg Co, 5211 Telegraph Rd, Los Angeles, Calif.* Kenco Mark VII, designed for punching, forming, blanking or bending of long extruded metal strips, consists of seven 5-ton punchpresses mounted on one common platen. Extremely long die plates can be used because of the synchronization of the rams and the distribution of power throughout the entire length of the machine (Dec 15, p132).

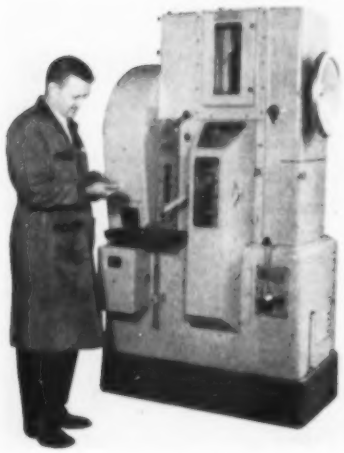
SMALL POWER PRESS — *Distributed by Wharton Unitools, PO Box 202, Valley Stream, LI, NY.* British-made Abro power press is suitable for blanking, piercing, clipping, and embossing of light gage metals, plastic, wire and other light materials. Automatic feed accepts coil or strip stock up to 5 in. wide and is variable over the feed range of 0 to 3 in. Standard fixed stroke is ½ in.; ram adjustment is ⅝ in. Press is rated at 2½ tons (Mar 24, p166).



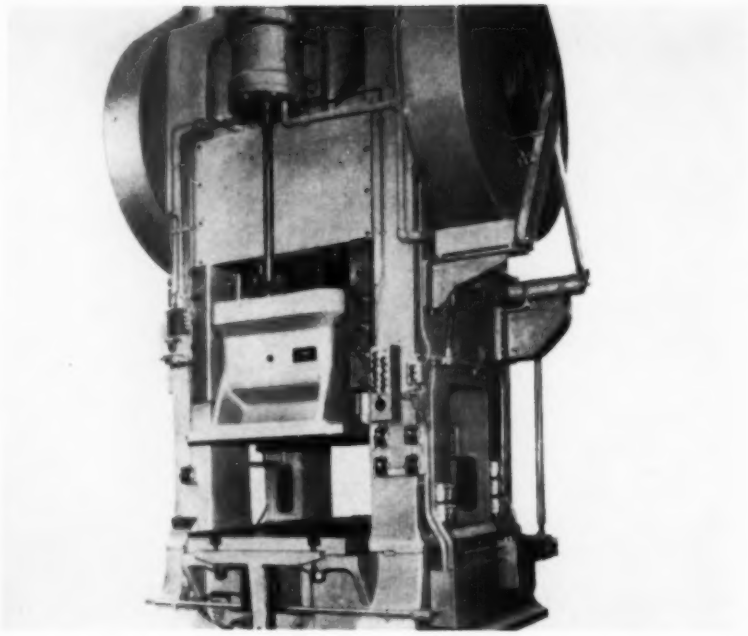
OBI PRESSES—*Baldwin-Lima-Hamilton Corp, Hamilton Div, Hamilton, Ohio.* Presses, in capacities of 75 and 90 tons, are designed for high-speed production of small stampings. Maximum operating speed is 40 strokes per min in the geared version and 90 spm in the non-geared. The 75-ton model has standard slide stroke of 4 in. (9 in. max), a shut height of 15½ in., and a slide adjustment of 3¼ in. (Oct 20, p210).

MOVING BOLSTERS—*E W Bliss Co, Press Div, 1375 Raff Rd, SW, Canton, Ohio.* The bolster travels on special tracks to a lowering mechanism built into the press bed, which lowers and positions the bolster assembly into the press. While this die is stamping out parts, another die is being secured to the other bolster outside of the press. To change dies, the bolster in the press is rolled out and the other bolster is rolled into position (Jul 14, p121).

TRIMMING PRESSES—*Erie Foundry Co, Erie, Penna.* New line of single-point, straight-side presses is designed for trimming forgings, but is also useful for blanking, forming and drawing. The presses feature central forced lubrication, air counterbalance, power ram adjustment, and an air-operated friction-type clutch. Various speeds and strokes can be supplied; capacities range from 150 to 600 tons (June 2, p120).

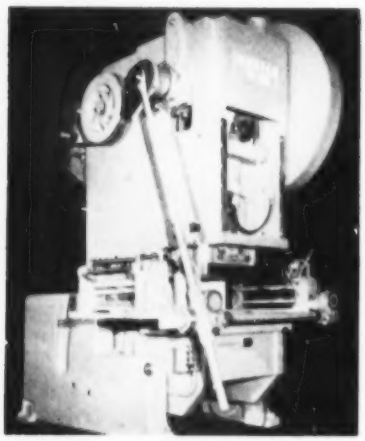


SECOND-OPERATION PRESSES — *Haller, Inc, 16580 Northville Rd, Northville, Mich.* This series of mechanical presses with a unique feeding mechanism permits automatic operation and quick setup for secondary operations such as assembling, marking, staking, crimping and sizing. Presses are available in capacities of 18 to 75 tons (Dec 15, p133).

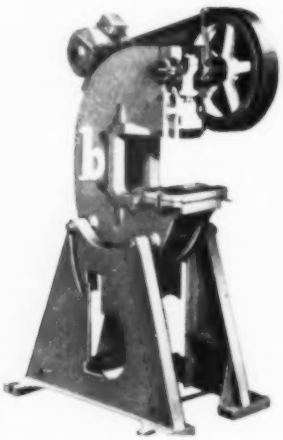


CLUTCH-BRAKE UNITS — *Fawick Corp, Fawick Airflex Div, 9919 Clinton Rd, Cleveland 11, Ohio.* Clutch-and-brake packages are available in four mounting arrangements to facilitate use on presses from 15 to 120 tons. Called Fawick Standardized Press Applications, these packages are for modernization of presses to pneumatic control (Sep 8, p129).

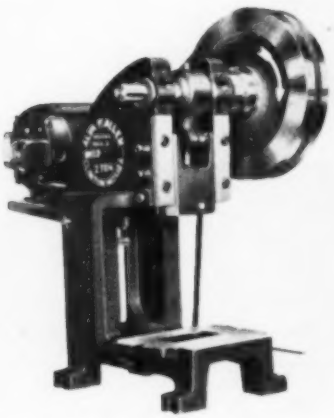
DOUBLE KNUCKLE JOINT PRESS — *E W Bliss Co, Press Div, Canton, Ohio.* Model K2 press permits multiple coining and the coining of large size or widely separated parts. Double knuckle arrangement, one in front and one in back, produces uniform two-point ram pressure for heavy tonnage operations on a 48 x 84-in. bed. 100-ton capacity unit is supplied with a 9-station front-to-back transfer feed (Feb 24, p152).



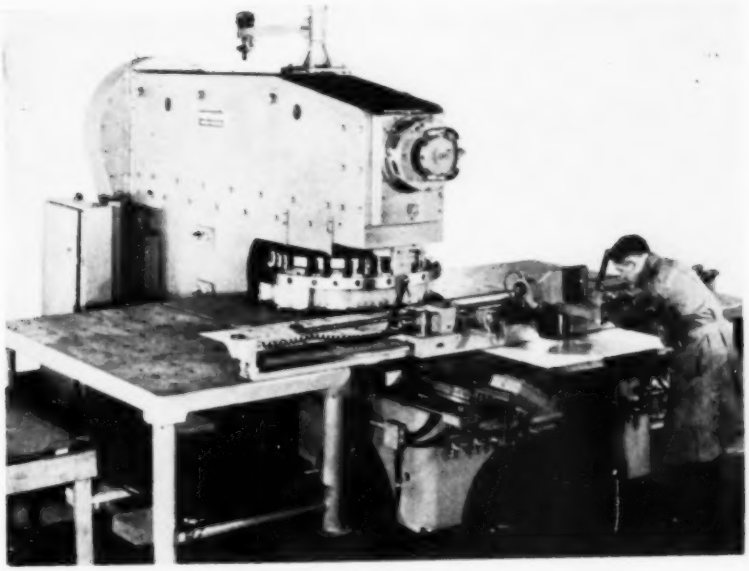
GAP PRESSES—*Minster Machine Co, Minster, Ohio.* Series G1 single-point gap presses with feeds for automatic production are available in capacities from 75 through 250 tons in both fixed base and inclinable types. Either single or double roll feed equipment can be supplied. Combination air - friction clutch and brake unit permits accurate control of single or multiple cycling (Jul 28, p102).



OBI PUNCHPRESS — *Benchmaster Mfg Co, Gardena, Calif.* Series 90 plain OBI punchpress, designed for punching to center of circles up to 24 in. in diameter, is available in three different shut heights—the standard 9 in., also 12 and 15 in. Plain types deliver approx 210 strokes per minute. Back-geared models deliver approx 1000 spm. Bed area is 8 x 11 in. Although standard stroke is 1¼ in., other strokes from 1½ to 3 in. can be supplied (Sep 22, p138).



BENCH-TYPE PUNCHPRESS — *Alva Allen Industries, Clinton, Mo.* Model BHS-2 2-ton punchpress provides 7-in. shut height; both throat and shut height are reported to be comparable to most standard 5-ton models. Standard stroke is ¾ in. with ¼ to 1½-in. strokes available at additional charge. Flywheel, for V-belt drive, has a recommended speed of 300 rpm and requires a 1/3-hp motor (Apr 21, p207).



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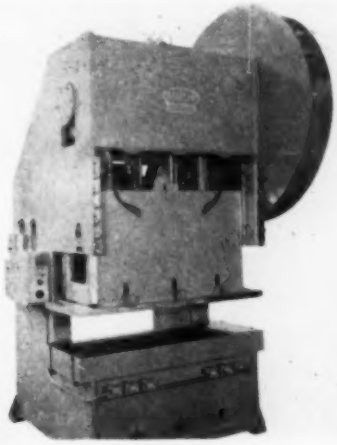
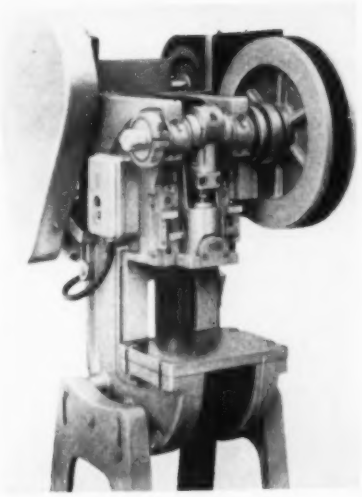
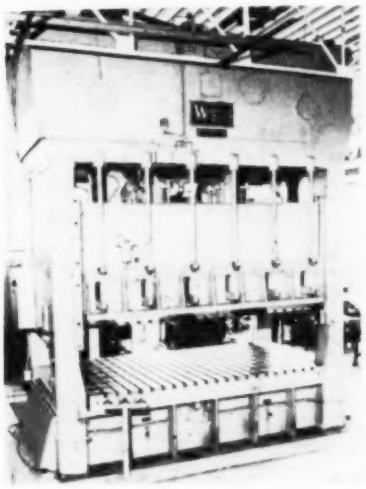
TURRET PUNCHPRESS — *Wiedemann Machine Co, 760 Gulph Rd, King of Prussia, Penna.* The 80-ton RA-101 uses a optical positioning system to locate holes from a non-dimensional, full-size drawing. The time required to fabricate panels and other parts up to 48 by 60 in. in a single press handling (48 x 120 in. in two handlings) is substantially reduced. Engineering time is reduced since detailed shop drawings are not required. Hole-to-hole and edge-to-hole dimensions are unnecessary (Jun 16, p127).



GAP PRESS — *Cleveland Punch & Shear Works Co, 5917 St Clair Ave, Cleveland 14, Ohio.* Designed for automatic feeds and greater convenience in handling large or irregular sheets, press incorporates an electrically controlled friction clutch. Slide is provided with power adjustment, is air-counterbalanced, has a stroke of 10 in., and 5-in. adjustment. Shut height is 22 in. Both bed and slide have an area of 28 x 72 in. (Jun 30, p112).

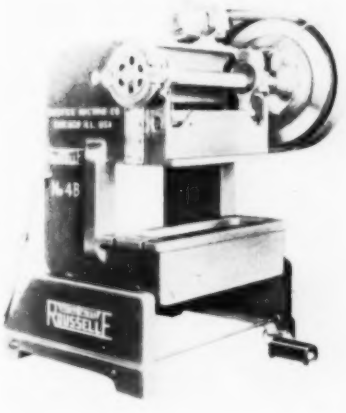


DEEP-DRAW PRESS — *Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* 10-ton press has been equipped with back gearing to prolong inertial force developed by the oversize flywheel over a long ram stroke, and to slow the ram speed. Units are available in three shut heights, 7¾, 10¾, and 13¾ in. Stroke lengths up to 3 in. max are available. Flywheel speeds are from 40 and 100 rpm (Feb 10, p176).



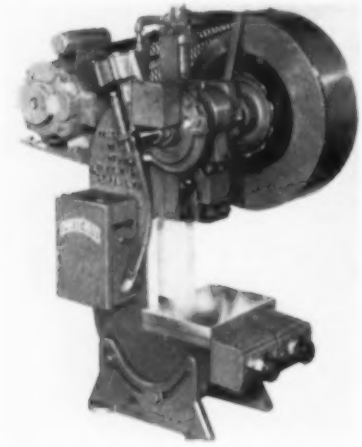
MECHANICAL PRESS — *Federal Machine and Welder Co, Warren, Ohio.* Specially designed for an aircraft manufacturer, press is used for production runs of deep drawn parts. It is a double back-geared, four-point eccentric gear press, and has a capacity, ½ in. from bottom of stroke, of 300 tons. Slide has an area of 90 x 136 in., with a stroke of 18 in. Operating speed is 14 spm (Mar 24, p152).

SLOW-SPEED PUNCHPRESS — *Kenco Mfg Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* Fifteen-ton punchpress is said to eliminate the gear noise inherent in gear-driven presses of this capacity. Designed for hand feeding, it also permits deep drawing. Press operates at 100 spm; other speeds from 50 to 150 spm are obtained by changing a pulley wheel. Standard throat depth is 6 in.; a 15-in.-deep model is also available (Jun 2, p122).

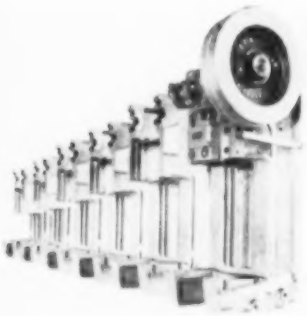


HORN PRESS — *Johnson Machine & Press Corp, 620 W Indiana Ave, Elkhart, Ind.* 60-ton-capacity press is designated H-60 and is offered in both flywheel and single back-geared models. Air clutch electrical controls are standard features. Distance from table to slide is 9 in., with standard 4-in. stroke down and the adjustment up. On special order, this can be increased to 33 in. Crankshaft strokes up to 12 in. available (Jan 13, p166).

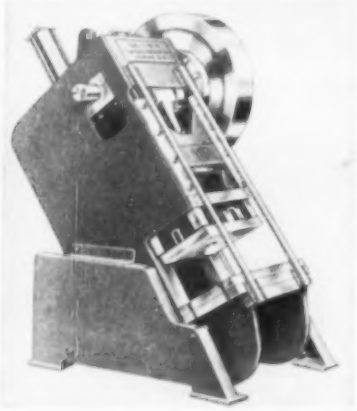
DOUBLE-CRANK PRESS — *Service Machine Co, 2310 W 78 St, Chicago, Ill.* Model 4B 40-ton, double-crank, OBI Rousselle punchpress features extra-large die area and an electrically controlled, air-operated friction clutch. Bed area is 16 x 48 in.; face of ram, 14 x 36 in. Die space is 12 in.; spacing between housings, 36 in. Press is adaptable for multiple punching and large workpieces (Mar 24, p146).



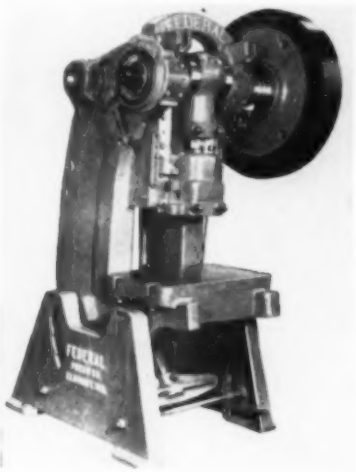
PRESS — *Sales Service Machine Tool Co, Press-Rite Div, 2365 University Ave, St Paul 14, Minn.* The speed of the standard No. 0, 5-ton, Press-Rite press has been boosted from 225 spm to 450 spm by addition of Airflex air-friction clutch. The clutch and brake are both of the constricting drum type, interlocked to prevent either from being engaged while the other is operating (Apr 21, p193).



PUNCHPRESSES — *Kenco Mfg Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* 32 different models are offered, in capacities of 2, 5, 8 and 15 tons, each model available in a complete range of shut-heights. Standard, deep-throat and universal presses are offered. The standard 5-ton press is available with shut-heights of 5, 6, 7½, 8½, 10 and 11½ in. (Dec 29, p78).



INCLINABLE PRESS — *Emhart Mfg Co, V & O Press Div, Hudson, NY.* Box slide press with 110-ton capacity has a self-cooling, diaphragm-type combination brake and clutch. Friction surfaces of both brake and clutch are of sintered metal to assure longer life. Both linings can be replaced without removing wheel. Slide has 35-in.-long ways, an exceptional length for a press this size (Apr 21, p197).



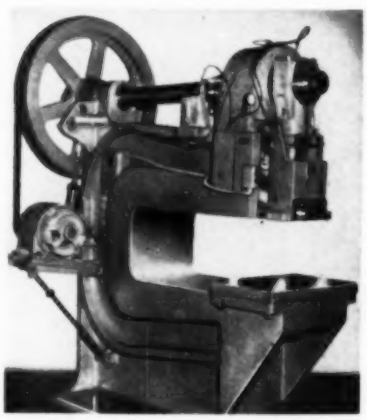
OBI PRESSES—*Federal Press Co, Division St, Elkhart, Ind.* Featuring heavier, one-piece cast-iron frames, presses are available in both fly-wheel and back-geared models, ranging in capacity from 7 to 100 tons. Other features include oversize crankshaft; solid, web-type fly-wheels; non-repeat safety clutch; and a front-operated reclining mechanism (Nov 17, p248).

BENCH-TYPE PUNCHPRESS — *Alva Allen Industries, 1001-15 North 3rd St, Clinton, Mo.* Model B-3 can be adapted for any standard punching operations within 3-ton capacity. On continuous operation, unit will produce up to 300 articles per min. Standard stroke is 1 in.; ¼ to 1½-in. strokes available at additional charge. Price of $139.50 includes adjustable crankshaft brake, motor mount, V-belt and motor pulley, less motor (Feb 24, p158).

DIAL FEED PRESSES — *Federal Press Co, Elkhart, Ind.* Principal design change involves method of driving the indexing cam. In new series it is driven by a center-guided, silent, automotive timing chain. Square design of dial provides an apron, width of which may be extended to provide for installation of hopper feeds. Presses will be produced in eight sizes with capacities from 6 to 80 tons (Apr 21, p208).

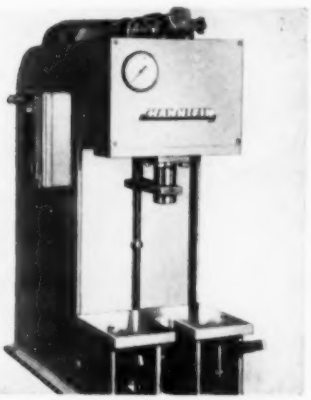
BENCH PRESS—*E W Bliss Co, 1375 Raff Rd, NW, Canton, Ohio.* Model 018-DT 7-ton, deep-throat, bench press is designed for high speed punching, cutting and forming operations on large, wide sheets. Standard stroke is 1¼ in.; maximum stroke available is 2½ in. Throat is 14 in. deep. Press weighs 600 lb and occupies bench space of only 27 x 13½ in. (Aug 25, p104).

PUNCHPRESS — *Kenco Manufacturing Co, 5211 Telegraph Rd, Los Angeles 22, Calif.* Electro-Safe 8-ton unit is designed with outstanding safety features. Any press failure, either mechanical or electrical, must fail safe. Press can be locked in any desired setting — continuous, single, inch, or foot control—by authorized personnel. Two models are available, standard OBI and 12¾-in. deep throat (Mar 10, p166).

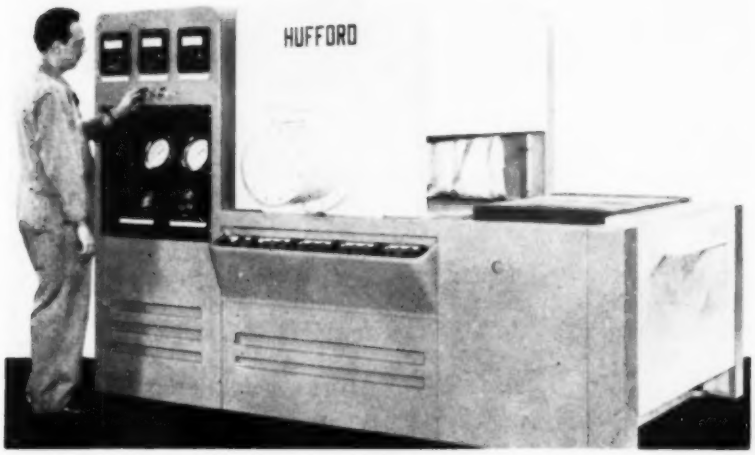


45-TON PRESS — *Perkins Machine Co, Warren, Mass.* Model 15M has 36-in. throat depth, 4-in.-dia shaft at pin bearing, 24 x 16 bed area, 14-in. open height, 750-lb 38-in. end flywheel, alloy cast frame. Total weight is 11,000 lb. Available in plain and geared models, and with pin or air clutch (Mar 10, p172).

PNEUMATIC MACHINE TOOL—*Convair Div of General Dynamics Corp, San Diego 12, Calif.* Dynapack is a compact, high-velocity, high-energy-rate machine tool that can be used for forging, forming, extruding, compacting, shearing of metals and other materials. The high velocity and energy rate of the pneumatic piston cause metals to flow plastically. Piston velocities of up to 400 fps are possible. Output energy ranges from 40,000 to 1,500,000 ft-lb, depending upon size of machine (Nov 17, p239).

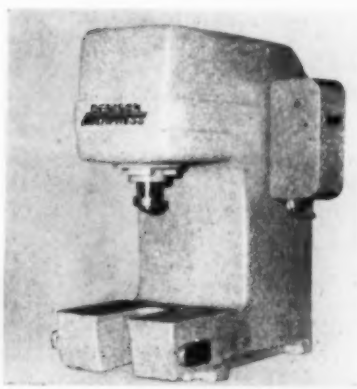


HYDRAULIC PRESS — *Hannifin Co, Machinery Div, Des Plaines, Ill.* Four-ton, high speed unit has been introduced for forming, trimming, and force-fit assembly operations. Stroke is 6 in.; reach from throat of frame to centerline of ram is 6 in.; gap is 12 in. Model has following speeds: down, advance, 700 ipm; down, feed, 330 ipm; return, 670 ipm. Press stands 39 in. above bench or other surface on which it is used (Mar 24, p156).



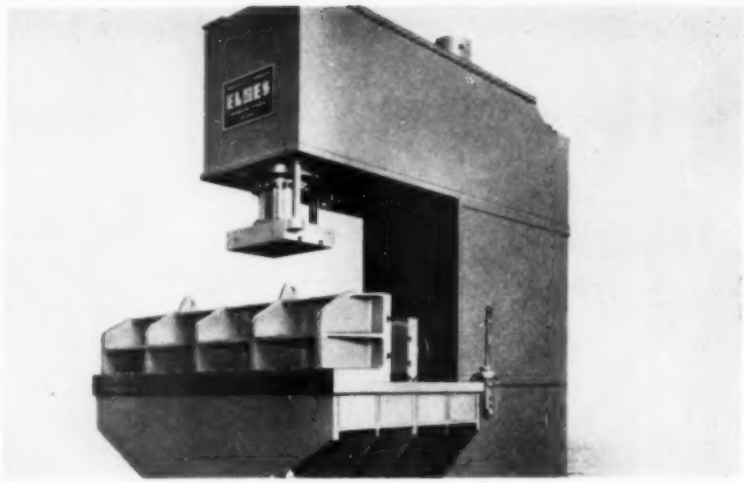
MOLDING PRESS—*Allied Engineering & Production Corp, 2421 Blanding Ave, Alameda, Calif.* 75-ton down-acting hydraulic molding press offers controlled approach speed and stepless tonnage adjustment from five to 75 tons. Press is available with electrically or steam heated platen arrangements. Platen working area is 13x13 in., with 12 in. of daylight and 12-in. stroke (Aug 25, p106).

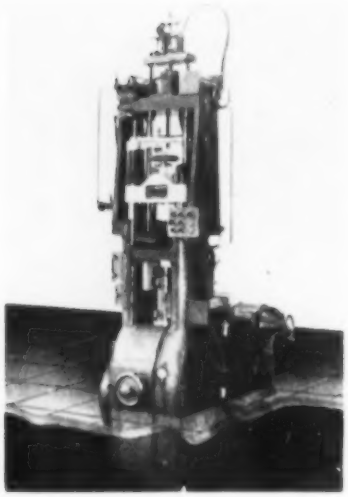
HOT FORMING PRESS—*Hufford Corp, El Segundo, Calif.* Model 173, 24-in. x 150-ton hot forming and sizing press is used mainly for hot forming high-alloy titanium to final configuration with no springback. The vertical pressing cylinder has a 6-in. stroke which actuates the lower heated platen; the upper heated platen is stationary. Platen temperatures are individually controllable from 200 to 1400 F within ±25 F (Sep 22, p136).



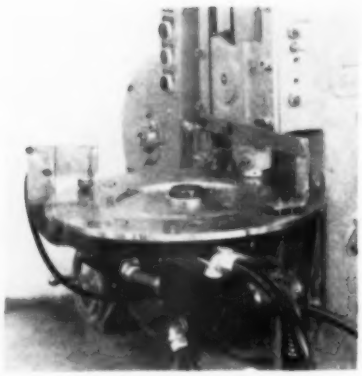
SMALL PRESSES — *Denison Engineering Div, American Brake Shoe Co, Columbus, Ohio.* Denison one- and two-ton Multipresses are designed for operations such as assembling, riveting, punching, marking, trimming, pelleting, compacting, testing, straightening broaching and swaging. They are easily adapted to various types of feed mechanisms (Apr 21, p194).

PRESS — *American Steel Foundries, Elmes Engineering Div, 1150-A Tennessee Ave, Cincinnati 29, Ohio.* Special hydraulic press combines the functions of both a C-frame press and a horizontal bulldozer. Downward-acting vertical ram has a capacity of 300 tons; platen size of 30 in. left-to-right by 24 in. front-to-back; stroke of 30 in.; and an opening of 54 in. Horizontal ram has a capacity of 150 tons; platen size of 30 in. left-to-right by 24 in. high; stroke of 24 in.; and an opening of 72½ in. (Jul 28, p108).





COMPACTING PRESS — *Baldwin-Lima-Hamilton Corp, Hamilton Div, Hamilton, Ohio.* Model 75-A is a 75-ton compacting press designed for compacting such materials as powdered metals, abrasives, carbides, cermets, ferrites, nuclear and other solid fuels for rockets and missiles. The press, a redesigned version of the former Model 20-A, affords higher production rates, eliminates problems and expense arising from powder loss (Aug 25, p103).

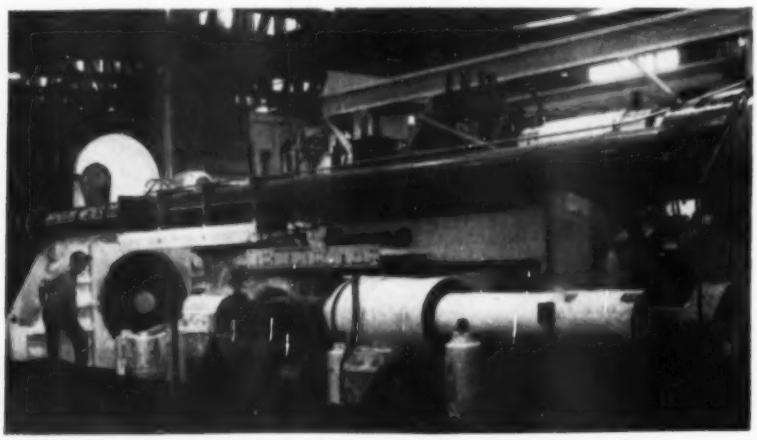


COMPACTING PRESS—*F J Stokes Corp, 5500 Tabor Rd, Philadelphia 20, Penna.* Powder metal parts frequently require restriking after sintering. This standard compacting press has been adapted to do this job. Essential component is the special feeding mechanism—a horizontal, rotating dial-plate with circular recesses around its periphery, into which are inserted individually designed holding plates for the particular parts (Oct 20, p214).

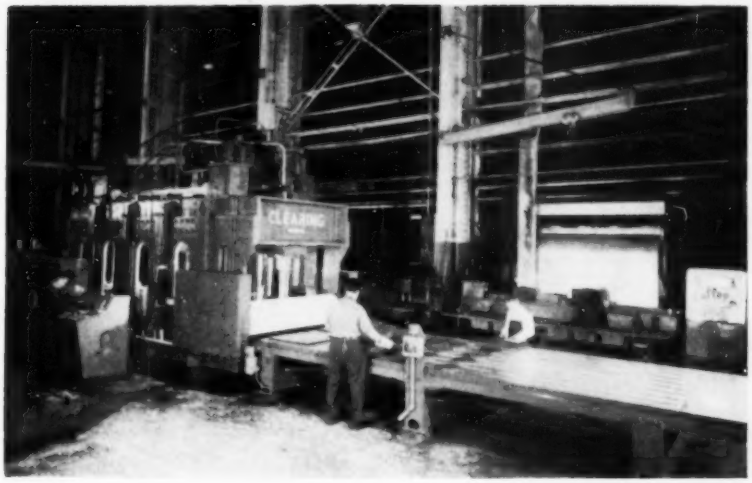
COMPACTING PRESSES—*F J Stokes Corp, Press Div, 5500 Tabor Rd, Philadelphia 20, Penna.* Hydraulic powder-metal compacting presses, Model 714, are basically single-acting presses with single upper punch motion delivering full pressure by means of the downward stroke of the hydraulic ram. Die table provides adjustable upward resistance to motion of the upper punch. Bottom punch is fixed. Presses are available with capacities of 100, 200, 300 and 500 tons (Jun 2, p128).

HYDRAULIC COMPACTING PRESSES—*Denison Engineering Div, American Brake Shoe Co, 1160 Dublin Rd, Columbus 16, Ohio.* Line of presses, capacities ranging from two through 75 tons, provides automatic, precise control of each step in compacting or pelletizing operations. These Multipresses eliminate scrap loss. Strokes are adjustable from 1/32 to ½ in. on presses through 10 tons and from ¼ to ½ in. on presses from 15 to 75 tons (Nov 3, p129).

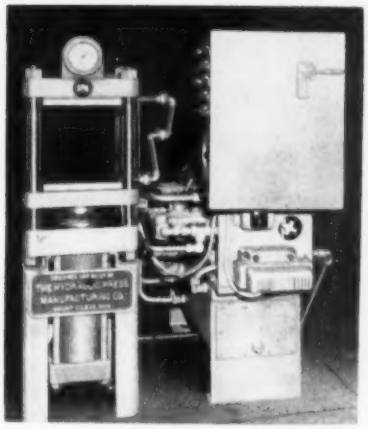
PLATEN ARBOR PRESSES — *Van Products Co, 5712 Swanville Rd, Erie, Penna.* 5- and 7½-ton presses are equipped with 12 x 12-in. platens for easy attachment of dies and heated platens, as well as regular operations such as bending, forming, laminating and broaching. They have adjustable power thrust and daylight, 4- or 8-in. stroke, 6½-in.-dia non-rotating rams, and a 7½-in. throat. Maximum daylight is 12¾ in. (Jul 14, p134).



EXTRUSION PRESS—*Loewy-Hydropress Div, Baldwin-Lima Hamilton Corp, 111 Fifth Ave, New York 3, NY.* 6000-ton extrusion press can switch from working nonferrous metals to extrusion of steel and titanium at the touch of a button, and containers can be changed in 20 to 30 minutes. Press has independent mandrel mover which can be stopped independently from the press movement for extrusion of unusual design (Mar 24, p99).



BONDING PRESS—*Clearing Machine Corp, Div of U S Industries, Inc, 6499 W 65th St, Chicago 38, Ill.* This 1400-ton hydraulic press bonds together thin-gage metal parts which have been pre-blanked into the desired shape and size. Both the press bed and the press slide are equipped with hot plates. The machine, including the tool plates, is 58 ft long. The press is 18 ft long by 7 ft wide (Aug 25, p101).



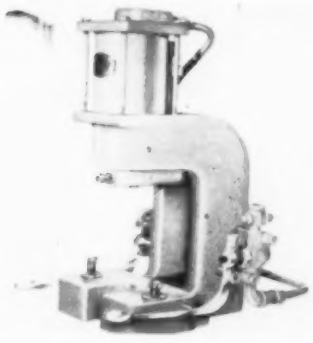
HOT PLATE PRESS—*Koehring Co, Hydraulic Press Mfg Co Div, Mt Gilead, Ohio.* Reported to be ideal for small parts production and laboratory work, this 50-ton upward-acting hot plate press is equipped for manual or semi-automatic operation. Press can be equipped with either steam or electrically heated plates. It has a 12 x 12-in. mold mounting space; 15-in. daylight (without plates); 15-in. stroke; 7½ hp (May 19, p157).

HYDRAULIC PRESSES—*E W Bliss Co, 1375 Raff Rd, SW, Canton 10, Ohio.* Latest additions to Hydro-Dynamic press line are several low-tonnage gap frame hydraulic presses, ranging from 10 to 100 tons in capacity. They are designed for high speed operation with quick advance speeds, slowed pressing speeds and rapid returns (Jun 30, p114).

AIR-HYDRAULIC PRESSES—*Studebaker Hydraulic Products Co, 1733 N 33 Ave, Melrose Park, Ill.* Designed for high-speed production, these air-hydraulic presses offer positive ram speed and stop control with no over-travel. Ram pressure is adjustable from two to 12 tons with identical speed cycle. Available in 2½, 5 and 10-ton models, press weighs 850 lb, has 12-in. daylight, and throat depth of 6½ in. (Nov 3, p136).

C-FRAME PRESSES — *Hydraulic Press Mfg Co, Div of Koehring Co, Mount Gilead, Ohio.* Available in 5, 10, and 15-ton capacities, hydraulic presses are offered in two manual and two automatic types. The basic automatic model provides controls for either single or automatic cycle, and ram reversal to either distance or pressure settings. The second automatic model has these features plus control elements for the hydraulic index table (Sep 22, p148).

SHOP PRESS—*K R Wilson Inc, Hydraulics Division, Main St, Arcade, NY.* The KRW 37KAA-150, designed to handle jobs up to 150 tons, is sensitive enough to process work requiring only the lightest pressure. It is equipped with heavy-duty geared winch with load securely held at any point to permit one-man adjustment of bed height. A 2-speed, hand-operated pump gives operator complete control of ram pressures (Jun 16, p136).



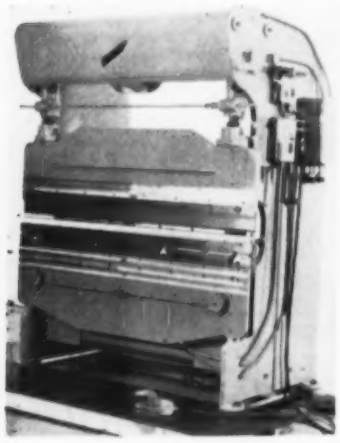
HOT SIZING PRESS — *Sheridan-Gray, Inc, 24701 Crenshaw Blvd, Torrance, Calif.* Titanium and high-temperature steel parts for aircraft and missiles are formed on this hot sizing press. Parts can be formed 13 times as fast and to infinitely more accurate tolerances than with bench methods formerly used. North American developed the machine and has applied for patents (Apr 7, p138).

C-FRAME PRESS — *Denison Engineering Div, American Brake Shoe Co, Columbus 16, Ohio.* "E" Series Multipresses, available in capacities of two to eight tons, are designed for assembly, crimping, forming, broaching, trimming and many other similar operations. Ram force, infinitely adjustable, ranges from 400 to 16,000 lb, depending upon the model (Dec 15, p135).

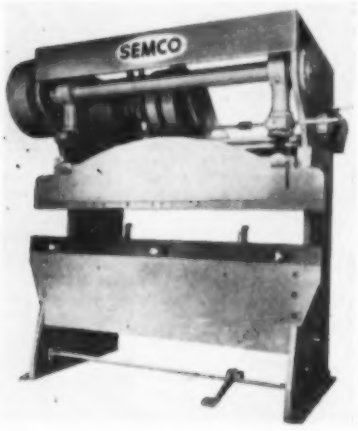
SMALL PNEUMATIC PRESSES—*Imported by the American LIP Corp, Room 704, 610 Fifth Ave, New York 20, NY.* Designed for production and assembly operations, these two presses, the PH 2 with a 500-lb capacity and the PH 3 with a 1700-lb capacity, operate on 85-psi air line pressure. Length of stroke is adjustable from 0.004 to 1.18 in. A micrometer depth stop with an accuracy of 0.0001 in. is built into presses. Ram speed is adjustable (Nov 17, p268).

SINGLE-ACTING AIR PRESSES — *Hugold Anderson, Inc, 70 Ernest St, Providence 5, RI.* Hugold 4 and Hugold 12 develop 400 lbs and 1200 lbs respectively. Improved design features include keyed ram, adjustable screw stop, honed and chrome-plated cylinder, hardened-and-ground ram and piston rod, and high capacity. Prices range from $57 to $103, less air lines and controls (Feb 10, p182).

COMPACTING PRESS—*Kux Machine Co, 6725 N Ridge, Chicago 16, Ill.* Automatic hydraulic press can compress two different materials in same operation. Two independent feed shoes and hoppers make possible bi-material compacting, such as combined iron-ceramic brake linings, or bi-metal electrical contacts, at production speeds up to 15 per minute. Models are available in 50 to 500-ton sizes (Nov 3, p132).

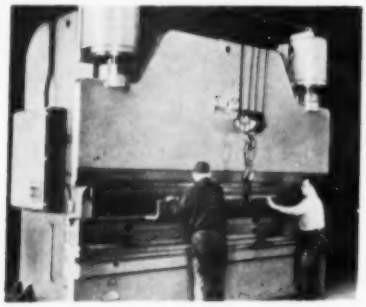


PRESS BRAKE — *O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* 6-ft Di-Acro Hydra-Power press brake has a forming capacity of 25 tons and has 62-in. clearance between housings. Stroke adjustment enables operator to have complete control of the ram during forming and punching operations. Forming of the part is done at slow speed but the downstroke prior to contact and the return stroke are at maximum speed (Apr 21, p188).

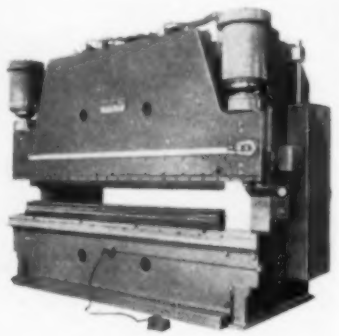


POWER PRESS BRAKES — *Service Machine Co, 196 Miller St, Elizabeth, NJ.* Brakes are available in two models. Both have a capacity of 35 tons. Model 635 has a bending capacity of 72 in., 12 gage; Model 835, 96 in., 14 gage. Brakes have 2-in. stroke, adjustment of 4 in., and can be powered by either a 3-hp, 1750-rpm motor providing 44 spm, or by a variable speed drive adjustable from 16 to 40 spm (Apr 21, p212).

SHEET METAL BENDER—*Dreis & Krump Mfg Co, 7400 S Loomis Blvd, Chicago 36, Ill.* Chicago Speed-Bender is particularly suited to production bending of heating and ventilating duct sections and similar long, light-gage work. Machine has a bending length of eight feet. The ram has a 2-in. stroke and is an acute-angle male die with the bending edge induction hardened for longer life (Jun 16, p134).



HYDRAULIC PRESS BRAKES — *Dreis & Krump Mfg Co, 7400 S Loomis Blvd, Chicago 36, Ill.* Units are currently available in six series with capacities from 300 to 2000 tons. Length of stroke is easily and accurately controlled, with full bending pressure obtainable at any part of the full stroke. Machine operation is controlled by a portable three-position foot switch (Mar 10, p162).

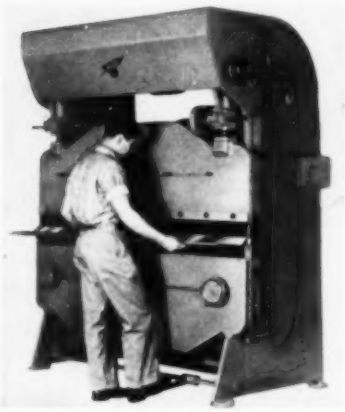


PRESS BRAKES—*Cleveland Crane & Engineering Co, Wickliffe, Ohio.* Steel-weld hydraulic press brakes are available in capacities up to 2000 tons for bending mild steel (from 10 gage to 2 in.) and in lengths up to 30 ft. Power is constant during entire stroke, which varies from 12 in. for the smallest brake (200 tons) to 18 in. for the larger machines. Stroke is adjustable. Two speeds are standard, except in the smaller machines (Aug 25, p102).

PRESS BRAKE — *Dreis & Krump Mfg Co, 7400 S Loomis Blvd, Chicago 36, Ill.* 25-ton Chicago press brake will bend 60 in. of 14 gage or 72 in. of 16-gage mild steel. Variable speed drive provides speeds from 20 to 50 spm. A 3-in. variation in die space is effected by manual adjustment of the bed. All bearings and gib surfaces are oiled by a one-shot lubricating system (Mar 24, p150).

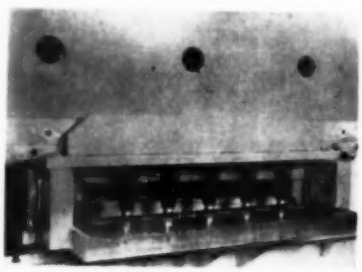
PORTABLE SHEET METAL BRAKE — *Miller-Knuth Div, Auburn Machine Works, Auburn, Nebr.* Portable and operable by one man, unit forms sharp angles, locks, hooks, heads, boots, seams, and hems. It can be dismantled by simply lifting sections apart. Brake is available in floor or bench models. Over-all length is 46 to 59 in. for four models (Jan 13, p159).

SHEET METAL BRAKES—*R E Smith Mfg Co, 1122 Elizabeth St, Waukegan, Ill.* Portable or bench-mounted 180° sheet metal brakes have many advanced design and operating features which permit rapid "freehand" forming and bending of sheet metal parts in 20-gage to 16-gage sheets from 26 to 36 in. wide. Brakes are available in plain, pan and universal models. They can bend complex forms, as well as do regular work (May 19, p171).

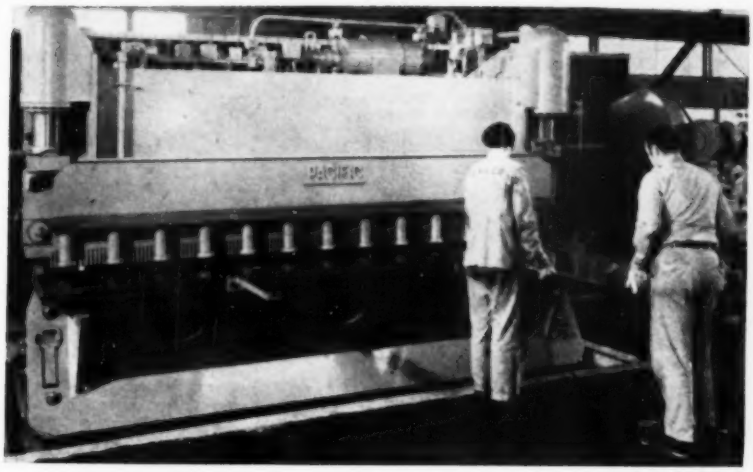


PRESS BRAKE—*O'Neil-Irwin Mfg Co, 512 Eighth Ave, Lake City, Minn.* Model 16-72 Di-Acro Hydra-Power press brake has a capacity of 25 tons. The stroke adjustment feature enables operator to pre-set stroke of ram to narrowest possible opening for each job. The ram travels at fast speed to a preset point just above work, goes through work part of stroke in slow speed and then resumes fast speed (Aug 25, p112).

SHEAR—*Cincinnati Shaper Co, PO Box 111, Cincinnati 11, Ohio.* Shear is designed to shear electrolytic copper as part of an automatic cutoff line. Machine is 4 ft 3 in. between housings and has a 6-in. gap. It has electric clutch control and operates at 65 spm. Machined openings in table permit installation of stock feeding equipment (Jul 28, p103).

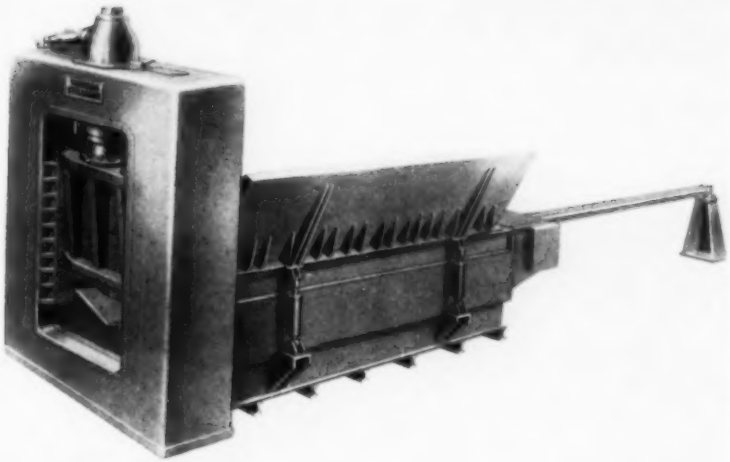


SHEARING ATTACHMENT — *Pacific Industrial Mfg Co, 848 49th Ave, Oakland 1, Calif.* Attachment for company's hydraulic press brakes cuts steel plate up to ½ in. thick and 4 ft long. Easily installed and removed, attachment reportedly does all the work of conventional shear at one-fourth the investment. Unit has positive hydraulic hold-downs and provides shockless shearing action (May 19, p178).



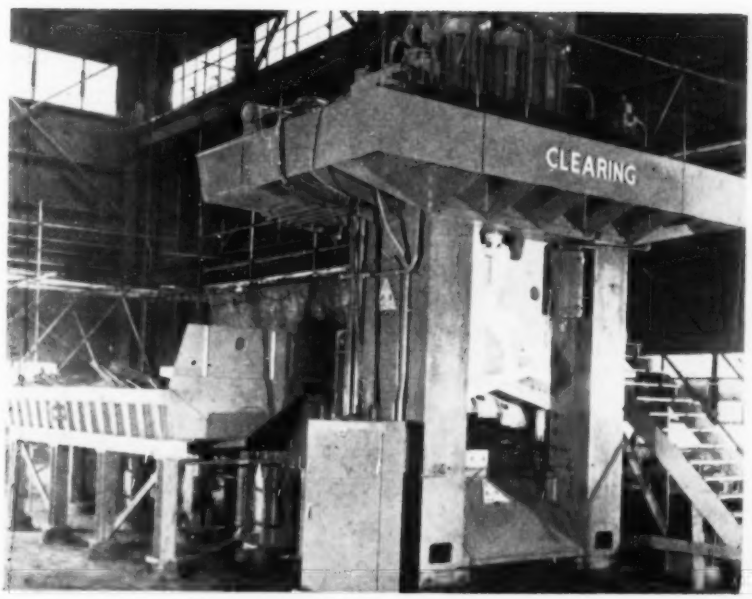
HYDRAULIC SHEAR—*Pacific Industrial Mfg Co, 848 49th Ave, Oakland 1, Calif.* Hydraulic shear, with rake angle adjustable for any metal thickness from 26 gage to ¼ in., cuts stainless, aluminum and most nonferrous alloys in sheet sizes from 4 to 12 to 7 x 19 ft. Blade is controlled by a foot pedal and can be stopped at any point throughout the stroke. Bending and bowing of drops are eliminated (Jun 2, p122).

SHEARING MACHINE — *Hydraulic Tool & Equipment Co, 10825 Sessler St, South Gate, Calif.* Shear-Ease cuts or shears steel angle iron up to 4 x 4 x ⅜, steel flat bars up to 3¾ x ⅜, steel rounds up to 1 in., and steel squares up to 1 in. Power is derived from hydraulic pump attached to electric motor. This 650-lb unit reportedly can do most of the work of a conventional shearing machine with the exception of punching (Feb 24, p164).



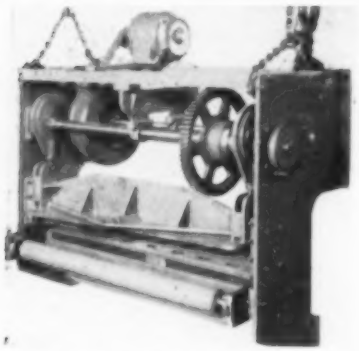
GANG PUNCHING MACHINE — *Verson Allsteel Press Co, 9300 S Kenwood Ave, Chicago 19, Ill.* Gang punching machine features light tonnage and large bed and ram area. It has a capacity of 60 tons and measures 126 in. between housings. Machine has a 4-in. stroke and a 4-in. power-driven ram adjustment. Shut height, bed to ram, is 14 in.; area of bed and ram, 20 x 132 in. Operating speed is 45 spm (Aug 11, p128).

SCRAP SHEAR — *Watson-Stillman Press Div, Farrel-Birmingham Co, Inc, 565 Blossom Rd, Rochester 10, NY.* This 750-ton hydraulic scrap shear cuts approximately 150 tons of miscellanous scrap or 250 tons of uniform plate scrap in an average 8-hr day. Machine will cut up to 7-in.-dia steel rounds, will also process tanks and other large fabricated products. Cutting length can be adjusted from 18 through 60 in. in 3-in. increments (Aug 11, p126).



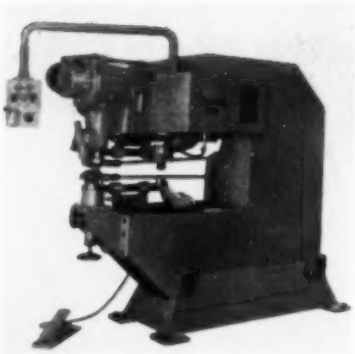
RING AND CIRCLE SHEARS — *Niagara Machine & Tool Works, 683 Northland Ave, Buffalo 11, NY.* Ring-and-circle shear is available in two power and two hand models for cutting circles from 3½ to 44 in. dia in material as heavy as 20-gage mild steel. Circle shear is available in two power and three hand models with capacities of 16-20 gage mild steel. They cut circles ranging from 3 to 60 in. in diameter. Rotary slitting shears are the cutting heads of circle shears (Feb 10, p154).

600-TON SCRAP SHEAR — *Distributed by Consolidated Mill Supply Co, 5843 S Loomis Blvd, Chicago 36, Ill.* Machine (made by Clearing Mach. Corp) will cut practically any kind of dissimilar scrap into equal lengths, adjustable in 6-in. increments from 6 to 48 in., at rate of up to 30 tons per hr. Material is loaded into hopper by magnetic crane; hopper is elevated and contents dumped into feedbox. Hydraulic ram in feedbox moves forward a distance equal to length of cut, pushing scrap under blades (Mar 24, p146).



SQUARING SHEARS—*Whitney Metal Tool Co, Rockford, Ill.* Specially designed shear can be fitted into a limited space in an existing production line. Part of the machine hangs below the conveyor line and is supported by bolting to some vertical members. Shear has a 2¾-in. stroke, a 52-in. blade, capacity of ⅛-in. mild steel, speed of 85 spm, and an electrically-operated pin clutch (May 19, p186).

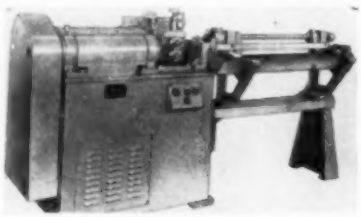
SHEARING AND FORMING MACHINE—*American Pullmax Co, Sheffield and Altgeld Sts, Chicago 14, Ill.* Model P-1 works sheet metal to 13 gage or lighter. Unit operates with stationary lower tool and reciprocating upper tool to do straight, circular, inside, irregular, slot and louver cutting as well as bending, joggling, flanging edge-bending, and dishing (Oct 6, p129).

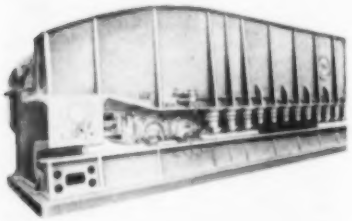


SHEARING AND FORMING MACHINE—*American Pullmax Co, Inc, 2455 N Sheffield Ave, Chicago 14, Ill.* Model U-10, largest in the Pullmax line of shearing and forming machines, has an edge cutting capacity of 13/32-in. mild steel. New model features automatic raising and lowering of the upper tool. Speed can be adjusted within the range 350-1800 strokes per min. Ten different stroke lengths are available, ranging from 0.001 to 0.375 in. (Dec 1, p137).

NIBBLING MACHINE — *American Chain & Cable Co, Inc, Campbell Machine Div, Bridgeport 2, Conn.* Campbell 2524 nibbling machine has a throat capacity of 24 in. and is capable of cutting low-carbon steels and other soft metals up to ¼ in. thickness and corrosion-resistant steels up to 3/16 in. Machine has speeds of 375 and 650 strokes per min and is powered by a 2-hp motor (Oct 20, p195).

SHEET-METAL SHEAR — *Lennox Tool & Machine Builders, Lima, Ohio.* Designated MetlMastr, machine is designed for circle and shape cutting, beading and forming of metal up to 0.281 in. thick. Model TE-165 cuts mild steel up to 0.135 in. thick; Model TE-218, up to 0.218 in. thick; and Model 281, up to 0.281 in. thick. Material is not punched; it is sheared. Cutting speeds range from 10 to 36 fpm, depending upon gage and material (Sep 8, p128).

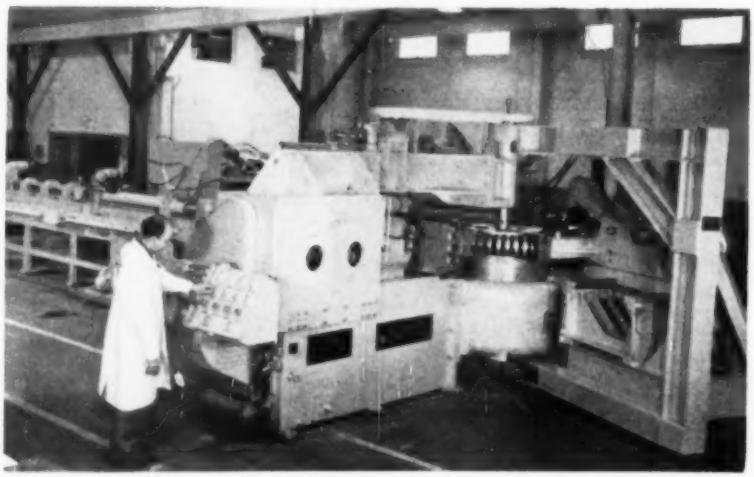




TRIMMING MACHINE — *American Machine & Foundry Co, Tool Div, Bloomfield, NJ.* Roto-Edge Cutter deburrs and trims sharp or uneven edges from workpieces and castings of metal, plastic, hard rubber, compositions and laminates in sheet, bar, block or other straight-edge forms. Powered by compressed air from any 25-psi source, machine is semi-portable, and requires less than three sq ft of floor space (Apr 21, p186).

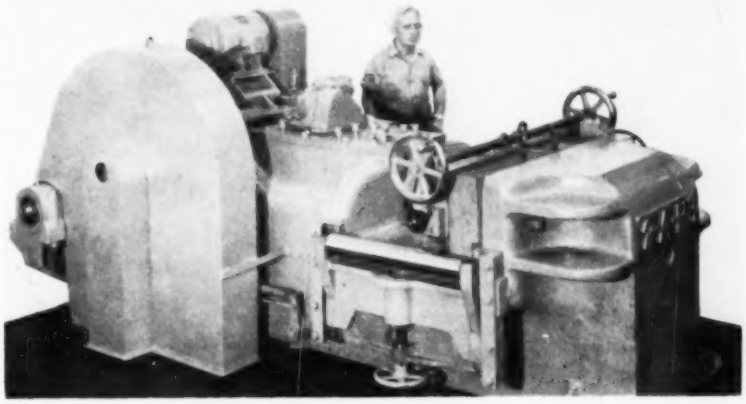
WIRE STRAIGHTENER-CUTTER — *Mettler Machine Tool, Inc, Adeline & Boulevard, New Haven, Conn.* Shuster 2AV variable speed automatic wire straightening and cutting machine provides feeds from 50 to 200 fpm. Features include high speed straightening arbor; Warner electric brake; angled electric control panel (Mar 10, p174).

ROLLER SHEAR—*Imported by Cosa Corp, 405 Lexington Ave, New York 17, NY.* This heavy-duty roller shear (German) is available in five models providing shearing capacity up to 1½ in., cutting length up to 60 ft, and max deviation from a straight line, on a 40-ft-long cut, of no more than 0.0125 in. Plates are sheared between a lower blade and an upper shearing roller that runs along lower blade (Dec 1, p149).

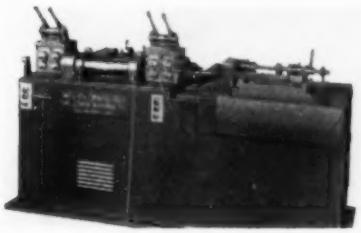


HYDRAULIC BENDER—*Pines Engineering Co, 601 Walnut St, Aurora, Ill.* Hydraulically operated unit forms ultra-thin 8-in.-OD x 0.020-in. stainless steel tubing on a 16-in. centerline radius. Features of the machine include a direct-acting hydraulic pressure die, direct-acting C-frame clamping die, and an independent retractable swinging arm that permits removal of the formed tube from the dies at the end of the bending stroke (Jun 16, p128).

BENDER AND STRAIGHTENER — *Wiliams-White & Co, 700 Third Ave, Moline, Ill.* No. 2A horizontal machine has 150-ton capacity; 1¾-in. stroke; 8-in. adjustment of ram (by power); speed of 40 spm. Unit is available with or without an automatic stop, jaw-type clutch controlled by treadle (Jan 13, p166).



WIRE STRAIGHTENER-CUTTER—*Lewis Machine Co, 3441 East 76 St, Cleveland 27, Ohio.* No. 4FHA is designed to straighten and cut wire in any lengths at speeds up to 500 fpm. It is a Travel-Cut, Flying-Shear model. Machine is designed to handle mild steel wire 3/32 to ¼ in. dia and high-carbon steel or stainless steel wire up to 3/16 in. dia (Oct 20, p193).

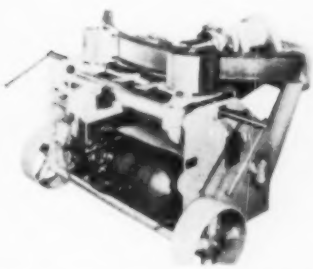


AUTOMATIC BENDING MACHINE—*Klaas Machine & Manufacturing Co, 4314 E 49th St, Cleveland 25, Ohio.* Unit will bend sheet metal up to 180° with a radius of bend from ¼ to 3 in. Push-button control automatically clamps material; rolls sheet around mandrel to any desired degree of bend; returns roll; and releases clamp. Desired radius is obtained by changing mandrel (Aug 11, p119).

LOCK SEAM SEALER — *E V Nielsen, Inc, 129 Broad St, Stamford, Conn.* Ram-Ex is designed to close any size lock seam in sheet metal up to 18 gage. Raised step on the tool furnishes only guide necessary (Jan 13, p170).

SERPENTINE BENDER—*Paul Machine Tool Division, Paul Machine Tool & Die Works, 4600 S Kedzie Ave, Chicago 32, Ill.* Bend-Ex Model S bends 0.017-in.-wall copper and aluminum tubing up to 40 ft long, ¼ to ⅝ in. dia on minimum centerline radii. Unit bends up to 180° at speeds up to 900 bends per hour. Model is equipped with automatic head, feed, and table return, and a quick-change angle selector. It is air operated (Jul 28, p110).

WIRE STRAIGHTENER-CUTTER — *Lewis Machine Co, 3441 E 76th St, Cleveland 27, Ohio.* No. 4FH Travel-Cut for high-speed cutting of welding rod and similar short items has 3/32 to ¼-in.-dia-capacity in mild steel, 3/16-in. max in high carbon, alloy and stainless. Feed speeds from 75 to 520 fpm are possible through use of a positive-action, high-speed shear actuating mechanism which travels with the rod and cuts while in motion (Mar 10, p159).



PORTABLE BENDER — *Wallace Supplies Mfg Co, 1304 Diversy Parkway, Chicago 14, Ill.* Model 420 will bend ¾ through 6-in. pipe, I-beams, channels, angles, or similar structural shapes. Single hydraulic valve brings ram cylinder in and out of bending position. Work is placed in support blocks shaped to fit the part being bent. Floor space is 7 ft 9 in. by 7 ft 6 in. (Feb 10, p156).

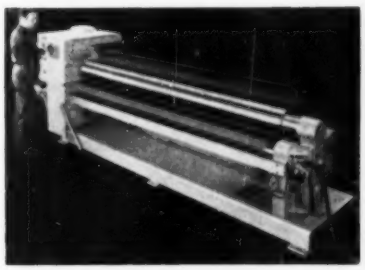
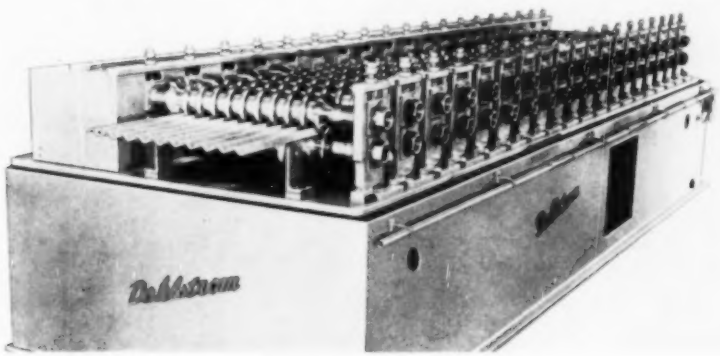


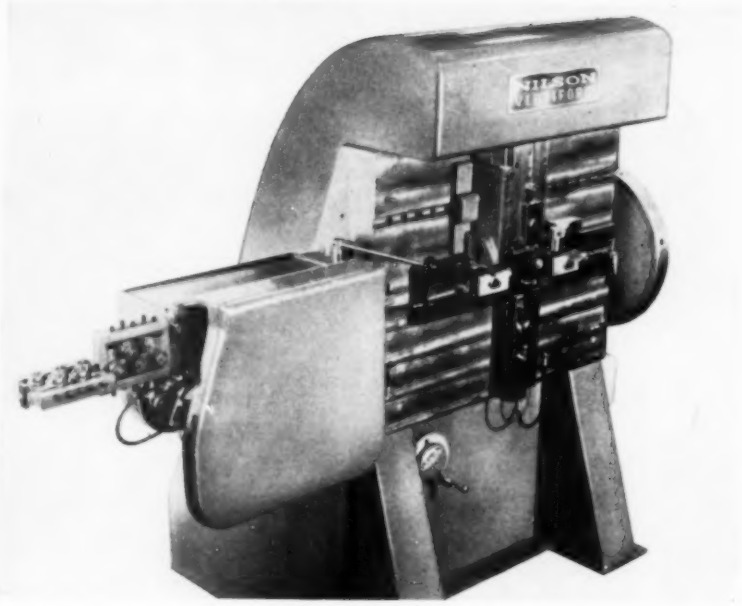
PLATE BENDING ROLLS—*Niagara Machine & Tool Works, 683 Northland Ave, Buffalo 11, NY.* Developed to turn out commercially true cylinders, these 9- and 10-in.-dia plate bending rolls handle metal plate up to ¾ in. thick. The 3-roll power drive enables work to be started more easily and curved more accurately. Machines are built in six sizes, in both the 9- and 10-in.-dia series, to handle material up to 168 in. long (Dec 15, p138).

AUTOMATIC BENDER—*Pedrick Tool and Machine Co, 3640 N Lawrence St, Philadelphia 40, Penna.* This 100% automatic bending machine, reported to be first rotary-head automatic, is machine loaded. Known as the Pedrimatic, the machine has no tangent limitations. It can produce U-bends whose tangents are 6 ft long, if desired. Machine is end loaded by either an air or hydraulic cylinder. Entrance of new piece ejects already bent piece (Nov 3, p131).



ROLL FORMING MACHINE — *Dahlstrom Machine Works, 4227 W Belmont Ave, Chicago 41, Ill.* Machine for corrugating sheets of galvanized steel, aluminized steel, plain and embossed aluminum, can handle gages 20 through 28 (other ranges available to meet requirements). Operating speed is 150 fpm. Roller die tooling is available for ½ or ¾-in. depth with excellent control of coverage and depth reported (Jan 13, p168).

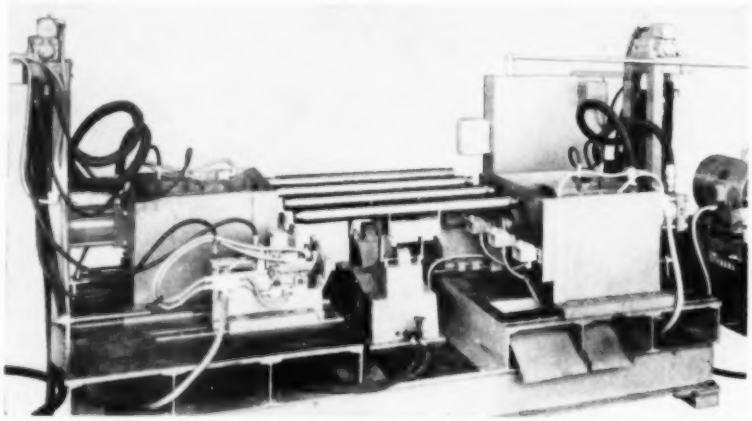
VERTICAL FOUR-SLIDE MACHINE — *A H Nilson Machine Company, Shelton, Conn.* Vertiform model V-187 provides four basic slides and as many as eight motions. It can handle both wire and ribbon metal. Machine provides a range of 30 to 120 strokes per minute. The low speed is used for tooling; production speed is usually 100 to 120 spm (Feb 10, p148).



TUBE BENDING PRESS — *Pines Engineering Co, Inc, 601 Walnut St, Aurora, Ill.* Model 3T tube bending press progressively forms a series of bends to different angles and planes in each piece of tubing as it passes through machine. Adequate clearance above and below dies permits forming of complicated shapes at speeds up to 1200 bends per hr. Max capacity is 1 in. OD (Apr 21, p193).

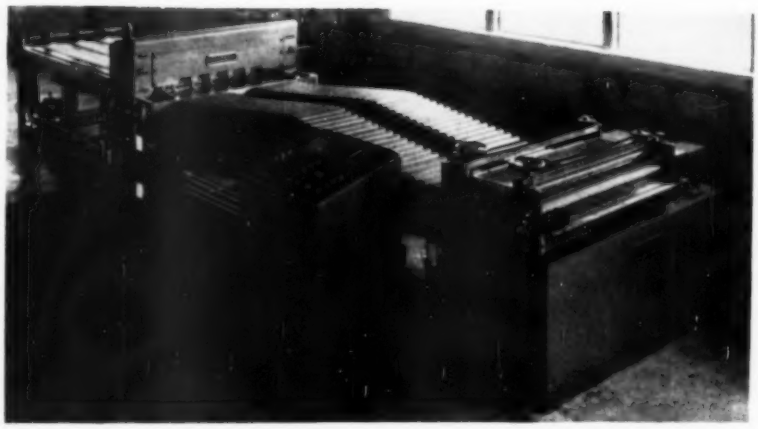
TUBE BENDERS — *Imperial Brass Mfg Co, 6300 W Howard St, Chicago 31, Ill.* Combination lever-type tube benders bend hard drawn copper, steel (including JIC), aluminum, and stainless steel tubing and thin wall conduit, in addition to soft tubing. The tools can handle tubing ranging in size from ¼ to ⅞-in. OD. Tools handle anywhere from 2 to 7 different sizes of tubing, depending on the model (Mar 10, p160).

RING ROLLING MACHINE — *M J Lubow, 121 W 64 St, New York 23, NY.* Machine can be used for making wire, strip metal or sheet metal rings and arcs. Large dia rings are rolled on inner rollers; smaller ones are rolled on outer rollers, and can be taken from machine while machine is running. Power is supplied by a 1-hp Reeves Vari-Drive through a chain drive (Mar 10, p182).

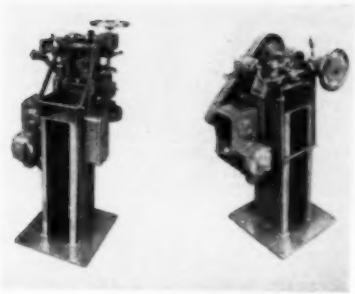


TUBE TRIMMING MACHINE — *Vulcan Tool Co, 730 Lorain Ave, Dayton 10, Ohio.* Completely automatic machine picks up tubes from idle station outside machine, carries them through, trims both ends and then deposits them in an idle station outside machine. Dies are adjustable to trim tubing 24 to 72 in. long and up to 4 in. OD (Apr 21, p179).

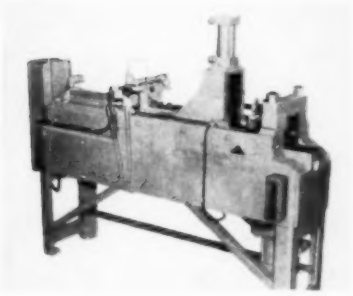
TUBE FORMER — *Vaill Engineering Co, 137 E Main St, Waterbury 20, Conn.* New machines are tooled to form tube ends to complex shapes in one operation. Normally, these complicated shapes would require multiple forming operations and extra handling of material. The machines provide considerable savings in equipment, tooling, production, and materials handling costs (Apr 21, p197).



DECOILING AND SHEARING LINES —*Secrest Machine Co, 1507 M St. NW, Washington 5, DC.* Designed to convert steel, stainless steel, aluminum and other metal coil stock to sheets, these lines, in their simplest form, consist of a coil reel, straightening roll, hump table, shear and conveyor, with all units wired into a console for electronic measuring and central control of the line. Lines are offered in widths up to 6 feet for metal thicknesses up to 10 gage (Sep 8, p130).

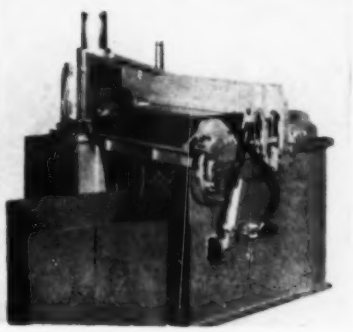


4-SLIDE MACHINE — *Baird Machine Co, Stratford, Conn.* Model 00 automatic wire former incorporates a flip-top vertical-swing bed which permits raising the machine to vertical positions for tooling, adjustment, and maintenance. Horizontal position is used when unit is in operation. Machine also provides increased feed length up to 4¼ in. with ample tooling areas at each position (Mar 10, p160).



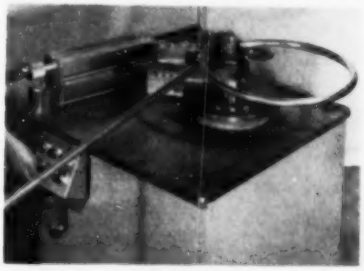
TUBE END FORMING MACHINE — *Vaill Engineering Co, 137 E Main St, Waterbury 20, Conn.* No. 7S Double Stroke unit is hydraulically operated. In addition to reducing or pointing the ends of tubing, unit can also be tooled up for expanding in diameter, flanging, flaring, double flaring, and beading the ends. Combinations may be obtained through double stroking feature (Feb 24, p158).

PORTABLE HYDRAULIC BENDER —*Walter P Hill, Inc, 22183 Telegraph Rd, Detroit 19, Mich.* Machine has a built-in 20-ton ram-design bender powered by a self-contained 1200-rpm, 2000-psi, 5-gpm hydraulic pump and tank unit. It is designed to bend electrical conduit pipe up to 2½-in. dia, solid bars up to 1½-in. dia, and angle forms. Adjustable bends with radii five times the pipe diameter can be produced on the machine (Dec 1, p156).

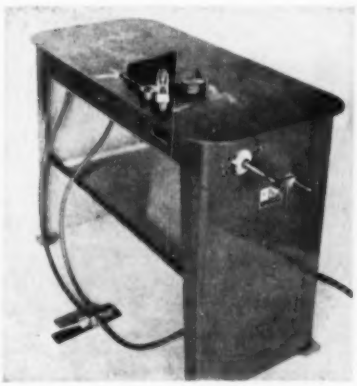


TANGENT BENDERS — *Taylor-Winfield Corp, Warren, Ohio.* Light Series of air-operated tangent bending machines is designed for bending on product sizes that do not require the heavier hydraulic machines. The duplex machine has adjustable double wings capable of handling a wide range of items from 11 in. upward. The distance between bends is 11 to 36 in., or can be made to meet special requirements (Jul 28, p112).

AUTOMATIC SPRING COILER — *Perkins Machine & Gear Co, West Springfield, Mass.* Machine has simple adjustments on its face for pitch, diameter and length of spring. Both right- and left-hand springs can be formed with standard equipment. The standard machine is capable of handling wire from 0.005 to 0.040 in. in diameter, and can produce coils from 0.045 in. minimum ID to 1¼ in. OD (Nov 17, p248).



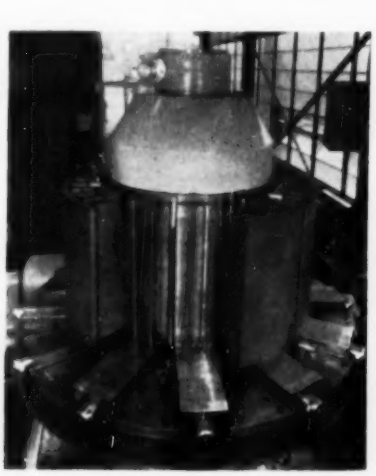
COILING MACHINE — *Curvit Corp, RFD 2, North Attleboro, Mass.* Series 150 semi-automatic coiling machine makes circles, U-shapes, and coils of any diameter (above a minimum). Stock is inserted by hand or from a rack. Machine can be equipped with deflecting rollers to form a helix. One inch tubing or ⅛ x 1-in. strip on edge can be formed into coils from 8 in. to 8 ft dia (May 5, p158).

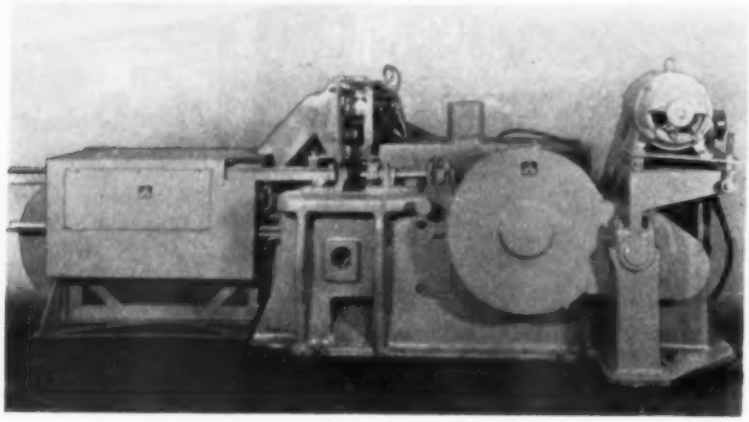


PNEUMATIC BENDER—*M J Lubow, 121 W 64 St, New York 23, NY.* Model ML6 produces 2000 or more bends per hr in rod, wire, tubing, extrusions or flat stock. It will bend to any angle, any radius, and can make scroll bends in one operation. Max capacity is two ⅜-in.-dia CRS wires. Machine is easily and quickly set up. Tooling changes are made by inserting pins in different holes in 6-in.-dia rotating plate (May 5, p152).

SHELL TRIMMING MACHINES — *Dayton Rogers Mfg Co, 2824-13th Ave South, Minneapolis 7, Minn.* Model ST-5 trims drawn shells up to and including 16-in. dia at production rate of up to 700 per hr. Model ST-6, a multiple-spindle unit, handles 6-in. drawn shells at rate of approx 3600 per hr. Special tooling for the trimming of individual shells runs from $100 to $250 (Dec 15, p136).

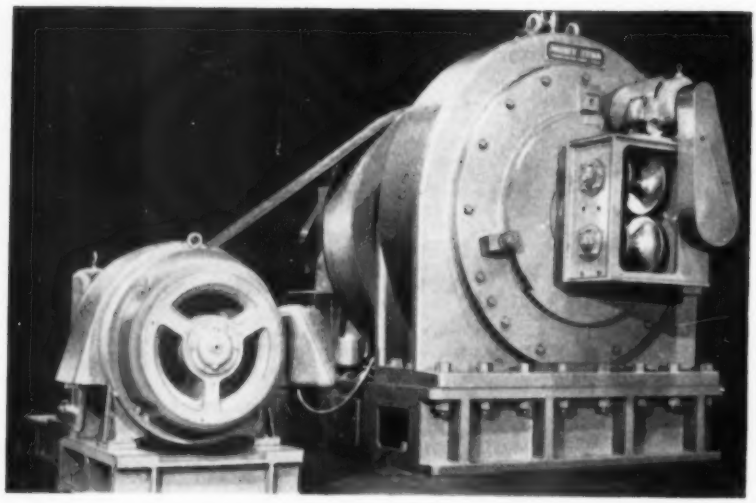
EXPANDER — *Grotnes Machine Works, Inc, 5454 N Wolcott Ave, Chicago 40, Ill.* Model 40-H-1580 expander has the power to expand 60 sq in. of metal having a yield strength of 46,000 psi. The machine has twelve jaws, a drawbar pull of 1580 tons and a hydraulic oil pressure of 3000 psi maximum. Machine weighs approximately 65,000 lb, is 14 ft high, 7 ft wide and 7 ft deep (Sep 22, p138).



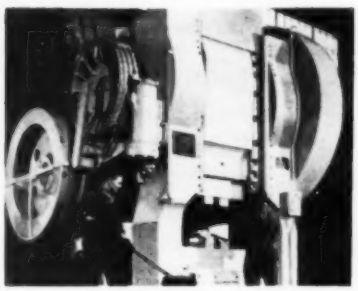


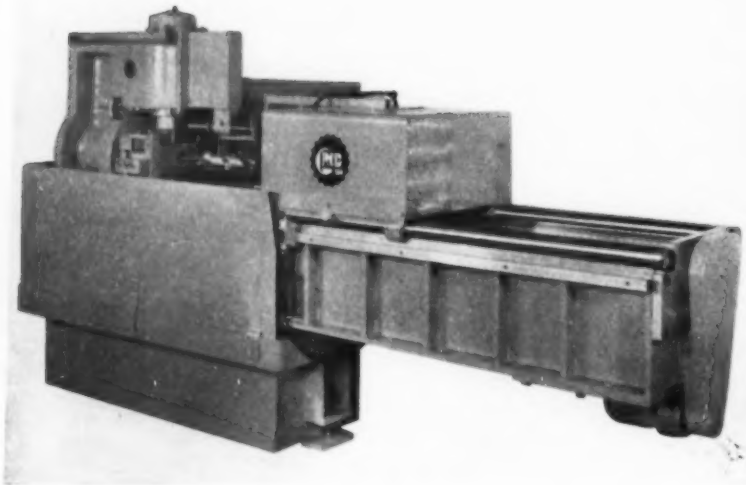
UPSET-FORGING MACHINES — *Hill Acme Co, 1201 W 65 St, Cleveland 2, Ohio.* Automatic upset-forging machines will be produced in the normal sizes of 1¼ in. to 5 in. for producing various products automatically. Material is pre-cut to length, heated, and fed into a receiving chute on the machine. These pieces are then gaged, picked up by the fingers, and passed progressively through the dies (Jul 14, p120).

ROTARY SWAGING MACHINE — *Torrington Co, Torrington, Conn.* Electro-hydraulic die closing rotary swaging machine makes reductions in the diameter of rods, heavy tubing, or other parts, such as aircraft control cable assemblies, which cannot be reduced by feeding into machine in usual manner. With die closing attachment, dies which rotate around work are brought in radially by means of hydraulically operated wedges (Apr 21, p190).



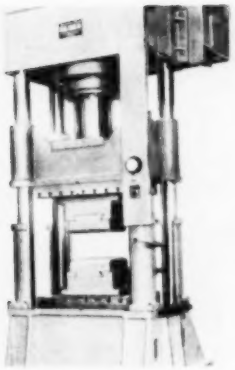
SWAGING MACHINE — *Abbey Etna Co, Perrysburg, Ohio.* No. 916 produces 8-in. saran-lined pipe. Pipe lengths pass completely through the swager spindle. Machine has power driven rolls at both entrance and exit. It has a 16-in. die length; swages at approx 15 fpm; delivers approx 2090 hammer blows per min at 88 rpm. With different dies the machine can handle pipe down to 2 in. (Nov 17, p238).



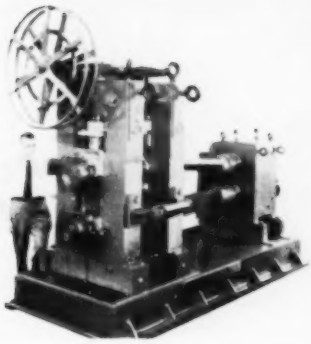


MECHANICAL FORGING PRESS — *Erie Foundry Co, Erie, Penna.* Over-all height of 2500-ton unit is 11 ft 3 in., a reduction of 3 ft below present models. This is accomplished by means of a scotch yoke (sliding block) to transmit pressure from the eccentric shaft to the ram. Front columns are spread and working area moved forward to give operators 8 in. more clearance for manipulating the work (Mar 10, p160).

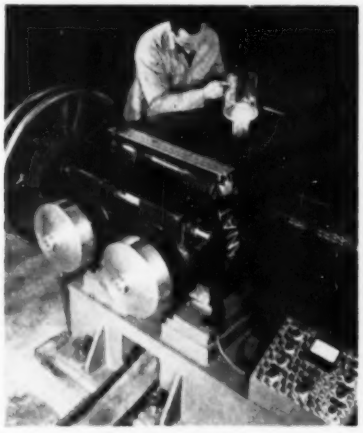
GEAR AND SPLINE ROLLERS — *Grob Inc, Grafton, Wis.* Grob Rolls produce strong, accurate, smooth gear or spline shapes in a single longitudinal pass. The No. 8 Roll, shown here, has a 6-in. capacity (maximum blank dia) and a 14-ft bed. Rolling is done in direction of grooves. As blank is fed at a constant rate through machine the rollers make and break contact with blank at a rate of up to 3500 contacts per minute (Oct 20, p192).



HOT FORGING PRESS — *American Steel Foundries, 1150-A Tennessee Ave, Cincinnati 29, Ohio.* Elmes 500-ton hydraulic press is designed for both open and closed die work. Bolster plates are fastened to slide and press bed. Unit can be operated by either of two control levers, one at the press itself, one remotely located. Same control levers are used to obtain short and rapid planishing strokes at full pressure (Dec 1, p141).

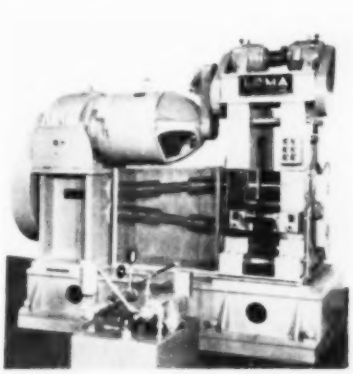


ROLLING MILL—*Fenn Mfg Co, Newington, Conn.* Model V4-126 two-high/four-high combination rolling mill can be used as a vertical mill for rolling powdered metals or converted to a standard horizontal mill for rolling strip. It has 12-in. rolls and is powered by a 40-hp variable-speed ac drive (Aug 11, p120).



POWDER-METAL ROLLING MILL — *Stanat Mfg Co, 500 Shames Dr, Westbury, LI, NY.* Horizontal rolling mill, Model TAH-625, compacts metal powders directly into strip and sheet, is also convertible to a vertical 2-high/4-high combination mill. Designed to produce materials in widths up to 7 in. and thicknesses ranging from 1/32 to 1/8 in., the machine has compacted such metal powders as aluminum, stainless steel, molybdenum and tungsten (Feb 10, p151).

DROP HAMMER—*Chambersburg Engineering Co, Chambersburg, Penna.* Specially designed for precision blow control and the use of automatic feeding devices, this electrically controlled forming drop hammer performs such operations as forming, embossing, coining, and re-striking in a single die impression. Blow intensities can be varied over a wide range by a few simple adjustments (May 5, p154).



COMBINATION ROLLING MILL — *Loma Machine Mfg Co, Inc, 114 E 32 St, New York 16, NY.* Heavy-duty 2-high 4-high combination rolling mill converts from a conventional vertical strip mill to a horizontal mill for compacting metal powders into sheet and strip. Changeover from the 8½ x 8-in. 2-high setup to the 2½ and 8½ x 8-in. 4-high setup takes only 30 minutes. Material up to ¼ in. thick can be made from powdered metal (Nov 3, p131).

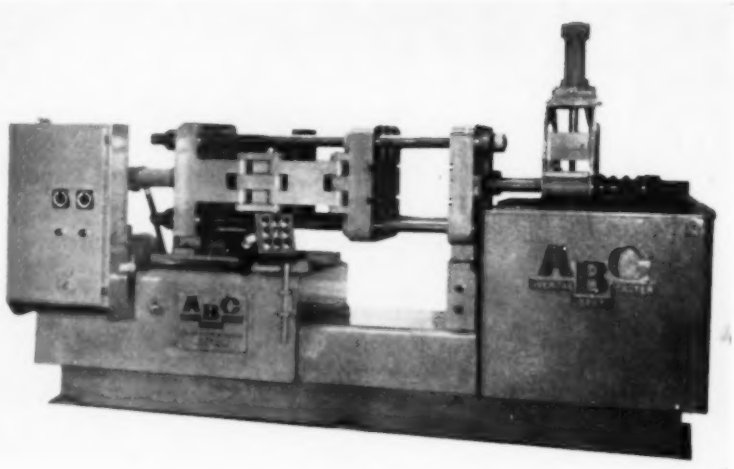
ROLL FLOWING LATHE — *Imported by Kurt Orban Co, Inc, 34 Exchange Pl, Jersey City 2, NJ.* Bokoe (German) automatic roll flowing and spinning lathe is hydraulically operated, with templet or wall-thickness controlled compound movements. It has an 86-in. swing and weighs 36,000 lb. Machine has been used for spinning and roll flowing searchlight housings, torpedo shells and missile casings (Apr 21, p183).

SWAGING MACHINE — *Fenn Mfg Co, Fenn Rd, Newington, Conn.* Model 1F is designed to replace the former Model 1A. Improvements include an extra-heavy, one-piece cast frame that provides rigidity, perfect alignment, and freedom from vibration. Unit has heavier drive. Motor and electrical parts are mounted within frame. Model requires floor space of 25 x 20½ in., weighs 625 lb (Feb 24, p160).

HAMMER FEED — *Chambersburg Engineering Co, Chambersburg, Penna.* Semi-automatic feed device permits restrike or coining of forgings, when used in conjunction with the company's new, electrically controlled, piston-lift, gravity drop hammer. Feed is mounted on a movable base, adjustable to suit various die heights (Aug 11, p121).

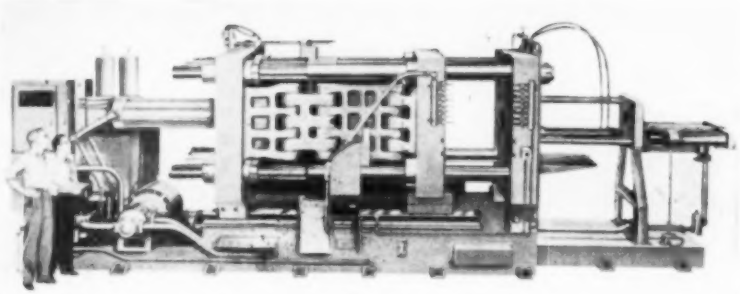
VERTICAL FLOTURN LATHE — *Lodge & Shipley Co, 3055 Colerain Ave, Cincinnati 25, Ohio.* No. 12 vertical Floturn lathe features a completely automatic production cycle; automatic loading and unloading can be provided. Tracer-controlled roller slides are mounted on a common carriage. Blank thickness variations are automatically compensated for, as is thermal expansion. Nominal workpiece capacity is 12 in. dia x 15 in. long (Dec 29, p73).

DIE CASTING MACHINE — ***ABC Die Casting Machine Co, 400 E 142 St, Dolton, Ill.*** Model 5000 is a hydraulically operated, heavy-duty machine with a shot capacity of 7 lb of zinc. Features include 150-ton, 2½-in. tiebars, 24 x 24-in. steel platens, an extra-large-capacity melting furnace, and manifold-mounted valves. It has high cycling speed and is convertible, with addition of cold chamber, for operation with aluminum (Mar 24, p154).



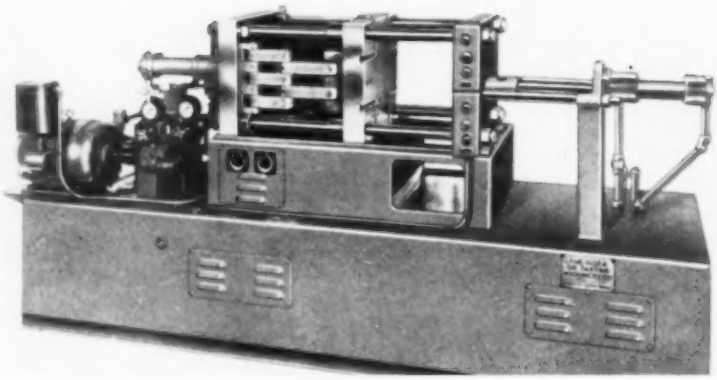
VACUUM MELTING UNIT — ***British Machines & Foundry Supplies, Ltd, Dept K40, Port Washington, NY.*** Clino Model 20-V vacuum melting furnace and casting machine is reported to be the first lowcost melting unit capable of making castings up to 15 lb. A quick-change "Zirconal" composite crucible provides slag-free pours. Machine features built-in transformer and vacuum pump (Apr 21, p190).

UNIT DIE—***Richards Tool and Mold Co, Racine, Wis.*** New improved Master-Mold unit die allows the use of the same core mold in producing two similar items in sequence. This means not only savings in costs of making a second core mold, but it allows the production of the second item to start within 20 minutes (May 5, p162).

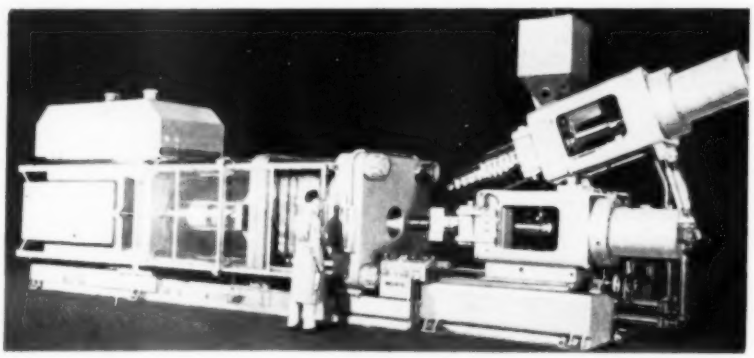


DIE CASTER — ***Cleveland Automatic Machine Co, 4932 Beech St, Cincinnati 12, Ohio.*** Cleveland hydraulic Model 100 is designed for rapid production of large aluminum die castings weighing up to 25 lbs. Plunger can be adjusted to attain any speed up to 480 fpm. At any predetermined plunger position shot intensifier can generate plunger pressures up to 26,000 psi. Locking pressure is 1000 tons (Apr 12, p207).

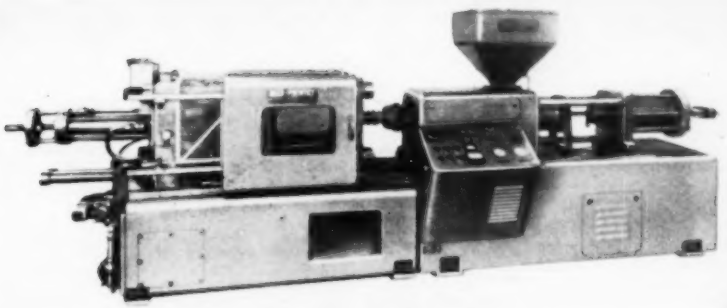
DIE CASTING MACHINE—***American Die Casting Machinery Co, 1744 W Winona St, Chicago 40, Ill.*** Model 150A, for aluminum, magnesium and brass, has a shot capacity of 2½ lb, at a rate up to 350 shots per hr. Die thickness is 6 in. minimum, 16 in. max. Machine is of cold chamber type and features automatic electric cycling at high speeds. Also available is the Model 150Z hot chamber machine for zinc, tin and lead (May 19, p152).



INJECTION MOLDING MACHINE — ***Lester-Phoenix, Inc, Dept N-41, 2711 Church Ave, Cleveland 13, Ohio.*** L-225-6/9 Ounce Lester is said to offer the longest adjustable stroke commercially available—from 16 to 8 in. with total daylight of 38 in. Dry cycle on an 8-in. stroke is 4 seconds; on a 16-in. stroke, 5 sec. Nominal shot size of the machine is 6 oz on a single feed and 9 oz on a double feed (Dec 1, p142).



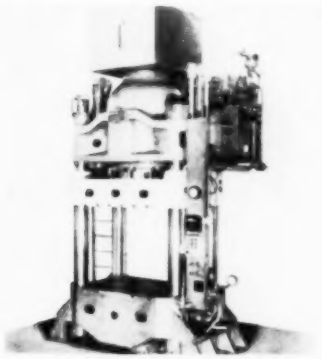
INJECTION MOLDER — ***Hydraulic Press Mfg Co, Div of Koehring Co, Mount Gilead, Ohio.*** Model 1500-P-300 injection molding machine for plastic parts up to 300 oz is a 1500-ton unit with an injection rate of 6640 cu in. of material per minute. Features include mold mounting area of 48 x 72 in.; full hydraulic mold clamp with 60-in. stroke; 106-in. daylight (Nov 17, p240).



INJECTION MOLDER—*Newbury Industries, Inc, Newbury, Ohio.* Portable Mini-Jector Wasp bench models 35 and 45 cut tooling costs through use of simple V-block parting-line sprued molds. Units are recommended for producing items in all thermoplastics, including nylon, from 1-oz pieces using max mold casting area of 6 sq in. down to intricate subminiatures. Price is under $1000 (Oct 20, p212).

VACUUM FORMING — *Auto-Vac Co, 1984 State St Extension, Bridgeport, Conn.* A new technique, called Air Cushion Control, makes it possible to deep-draw form heavy-gage polyethylene of all types, with high uniformity of wall thickness and relatively low corner radii. The method is equally successful for thin or heavy-gage Kralastic, heavy sections of high-impact styrene, vinyl, and other thermoplastics (Mar 24, p148).

PLASTIC FORMER — *Auto-Vac Co, Div of National Tool Co, 1984 State St Extension, Bridgeport, Conn.* Lab-Vac thermoplastic forming machine can now be used for plug forming. Plug forming attachment is available for applications where deep-draw forming with minimum side-wall taper is required. Speed and depth control of plug stroke and manual air-cushioning controls are incorporated for max operating efficiency (Nov 17, p244).



PLASTICS MOLDING PRESS—*Birdsboro Steel Foundry & Machine Co, Birdsboro, Penna.* Self-contained oil-hydraulic molding press capable of curing cycle times up to 45 minutes has been designed for General Electric for molding special electrical equipment products. Max pressure is 1650 tons. Four-column vertical unit has a 34-in. stroke. Platen area is 62 x 62 in., with daylight of 4 ft 8 in. (May 5, p164).

PORTABLE PLASTIC MOLDER—*Unex Laboratories, Hathorne, Mass.* Unex Jet permits testing experimental parts or new designs prior to ordering production dies. Die sets can be changed in less than a minute. Interchangeable injection cylinders permit rapid change of plastic materials and colors. Machine has max shot capacity of approx one-half ounce or ¾ cu-in. Molder can handle all thermoplastics including nylon (Sep 8, p132).

PLASTIC MOLDING MACHINE—*Automatic Molding Machine Co, Subsidiary of Wagner Bros, Inc, 3201 Exposition Pl, Los Angeles, Calif.* High-speed, air-toggle powered automatic plastic molding machines are available in two models, A50-B and A25-B. Designed to handle conventional thermosetting materials and alkyds, the machines operate on existing (100 psi) shop air supply and depending on model, provide from 25 to 50 tons pressure (May 5, p156).

PLASTIC FORMING—*Welding Engineers, Inc, Norristown, Penna.* Commercial equipment for air-slip or "bubble-gum" thermoforming of plastics is now available. This forming method is said to provide more uniform wall thickness at lower cost. A sheet of thermoplastic material is heated and softened, then blown into a bubble of predetermined size. The mold is raised into the bubble's cavity, the air is exhausted and the bubble is pulled down around the mold (May 19, p151).

PRESS FEED — *Cooper Weymouth, Inc, 600 Honeyspot Rd, Stratford, Conn.* Cabinet model heavy-duty air feed with plain stock straightener is designed for short run feeding for mechanical and hydraulic presses. Operating on 60 to 100-psi air pressure, unit has a max pull of 650 lb and gripping force of over a ton. Available in R-to-L or L-to-R feeding models, feeder has capacities (mild steel) of 3/16 in. thick by 12 in. wide, ⅛ x 18, 3/32 x 24 in. (Apr 21, p182).

SHEAR FEED — *Press Automation Systems, Inc, 25418 Ryan Rd, Warren, Mich.* High-speed unit accurately gages and feeds sheet, coil, or strip stock from standard square shears to provide automatic trim or cutoff operations. Called the Shear-Pacer, unit mounts at rear of standard square shear; its electrical control system is integrated with that of shear. Stock feed rate is adjustable from 80 to 300 fpm (Dec 1, p158).

PLASTIC MOLDER — *Reed-Prentice Div, Package Machinery Co, East Longmeadow, Mass.* Jetflo plastic molder combines efficient plasticizing of extruder with speed and accuracy of an injection molder to facilitate high speed molding of thin sections, increased speed for conventional items, and higher quality. The Jetflo 6 dry cycles in 1.3 sec at minimum stroke and 2.9 sec. at max 8-in. stroke (Dec 29, p77).

PRESS-FEEDING DEVICE — *Producto Machine Co, 990 Housatonic Ave, Bridgeport 1, Conn.* Surefeed is available in two models to suit 2- and 3-in. max stock widths. Only two drive plates and simple linkage, controlled by movement of the press, are required to advance the stock. No press or feed alterations are necessary to mount device in an ordinary press (Apr 21, p184).

PRESS FEED — *Cooper Weymouth, Inc, 600 Honeyspot Rd, Stratford, Conn.* Completely redesigned medium-duty air feed is designed for mechanical and hydraulic stamping press, but can also be used for feeding power shears, power brakes, four-slide machines and welders. Rated capacity, for mild steel, is ⅛ in. thick x 6 in. wide, 1/16 x 12, and 1/32 x 18 in. (Apr 21, p192).

HITCH-FEED — *Precision Welder & Flexopress Corp, 5520 Ibsen, Cincinnati, Ohio.* Press feed arrangement, designated Flexofeed, hitch feeds coil stock at 2200 to 2500 ipm, with accuracy to ± 0.002 in. Feed strokes up to 36 in. are possible. Flexofeed is used in conjunction with a standard high-speed Flexopress which uses conventional dies. The mechanism is actuated by mechanical linkage driven directly from the press (Mar 24, p150).

PORTABLE TRANSFER FEED — *E W Bliss Co, Canton, Ohio.* Most straight side presses can be converted to automatic transfer feed operation by means of this portable unit that can also be used to move material through a series of presses. It is operated through one power take-off from the press crank, or may be independently powered and set up to control press cycle (Jan 13, p158).

DIAL INDEX FEED—*Benchmaster Mfg Co, 1835 W Rosecrans Ave, Gardena, Calif.* Feed features a completely different indexing motion at press speeds as high as 280 spm, as well as increased shut height on the press. Feed is equipped with a choice of 12 or 15-in. table diameters, has provisions for either 10 or 12 stations. Total table height has been reduced to 2¾ in. (Sep 8, p152).

ROLL FEEDS — *Benchmaster Mfg Co, 1835 Rosecrans Ave, Gardena, Calif.* Clutch mechanism is based on a friction spring wrapped around a shaft. As torque is applied in same direction as spring is wound, spring tightens on shaft, transmitting rotational motion. When direction is reversed, spring loosens and slips freely. Units are available in roll widths of 3, 5, 7 and 9 in. Stroke lengths are 0 to 3 or 0 to 6-in. cutoff (Feb 10, p178).

ROLL FEEDS—*Jaco Devices, Inc, Hingham, Mass.* Twenty-six new sizes have been added to company's line of lowcost, automatic roll feeds for punchpresses. With a total of 39 standard sizes, the line has a range of feed increments from 1 in. to 20 in. in length and up to 20 in. in width. Feeds are designed for side or rear feeding and will fit any light or heavy-duty punchpress (Oct 6, p132).

PRESS EXTRACTOR — *Sahlin Engineering Co, PO Box 289, Birmingham, Mich.* Over-all length of the 6000 Series horizontal Iron Hand is only 18 in. greater than length of stroke. Models range in stroke length from 36 in. with speeds up to 40 spm. Features include use of geared non-slip belt in place of roller chains or rack and pinions. Universally adjustable jaw permits grabbing of the piece at any angle (Apr 7, p142).

DIE MANIPULATOR—*E W Bliss Co, 1375 Raff Rd. SE, Canton 10, Ohio.* Die handling machine can be used either to turn over a die set or to open a set for maintenance without danger of damaging the dies. The wheel-mounted platens are raised and rolled over by the powered screw lift and turnover drive in the housings. Open-top construction permits removal of a half die by crane at any point in the operation (May 5, p158).

COOLANT-LUBRICANT PACKAGE—*J N Fauver Co, 51 W Hancock, Detroit 1, Mich.* Unit provides constant flow of oil to a "Dynamatic" press drive. Separate system, mounted on same reservoir, provides positive lubrication to clutch bearings. Gages, oil level indicators, and protective pressure switches provide prompt signals in case oil or water flow is interrupted. Reservoir capacity is 150 gal; flow rate, 50 gpm (Feb 10, p172).

SIDE-ARM EXTRACTOR—*Sahlin Engineering Co, PO Box 289, Birmingham, Mich.* Automatic press unloader has over-all length only 18 in. greater than its stroke of 8 ft. Compact unit is supplied with a portable base. Jaw assembly (standard Iron Hand jaw) can be moved on the frame so that it can operate on either left or right side. Assembly is adjustable for height and angle of extraction (Nov 17, p246).

TRANSFER UNIT — *Livernois Engineering Co, 25200 Trowbridge, Dearborn, Mich.* Designed primarily for press automation, this transfer unit is completely mechanical. Unit is actuated entirely by the ram movement. Two models are available—Model A, for most presses, has a transfer distance of 0 to 7 in.; Model B, for the larger presses, has a transfer distance of 0 to to 36 in. (Apr 21, p195).

LOADER-EJECTOR—*Press Engineering Co, 5722 W Chicago Ave, Chicago 51, Ill.* Device for OBI presses is a mechanical hand that picks up the product parts in succession from adjacent table, locates each precisely in die nest, actuates press, and ejects finished part. Operator's hands are never brought into die area. Available for backgeared presses operating at 30 to 60 spm, and for flywheel presses to 165 spm (Nov 3, p140).

AUTOMATIC SHEET FEEDER — *The de Florez Co, Div of the Dexter Co, 116 E 30th St, New York NY.* Feeder handles metal, plastics, and other materials in flat or formed sheets, either rectangular or irregularly shaped. Material may be picked up and/or delivered horizontally, vertically, or at any angular position. Sheets up to 6 x 15 ft can be handled from piles up to 4 ft high at speeds up to 15 per minute (Feb 24, p158).

STANDARDIZED TRANSFER UNITS —*Die & Automation, Inc, 5353 Dixie Highway, Hamilton, Ohio.* Press-Matic transfer units automatically load and unload parts in and out of dies in any type of punchpress, and transfer parts between presses. Standard punchpress lines can be fully automated to produce up to 18 pieces per minute. Units are floor - mounted, self - contained and equipped with both air and electrical connections (May 5, p150).

VACUUM LIFT—*F J Littell Machine Co, Vac-U-Mation Div, Dept 3C, 4555 N Ravenswood Ave, Chicago 40, Ill.* No. 12651 Vac-U-Mation 4-cup lifter, with a capacity of 2000 lb, features a power tilting arrangement. The power tilt gives new versatility to vacuum lifting in that the cups are automatically rotated to vertical or horizontal positions. Interlocking safety checks insure fail-safe rotation both electrically and mechanically (May 5, p156).

DIE HANDLER—*Hansford Mfg Corp, 1239 University Ave, Rochester 7, NY.* Mod 1 1018 die handler is a small unit featuring all-cast construction. The open top platen gives access to the top of a die and any screws entering from the top. The four-leadscrew construction with thrust bearings allows off-center pull such as needed in separating two-post dies or for off-center "tryout forces" up to 1000 lb (Jun 30, p108).

AUTOMATIC CENTERING REELS—*F J Littell Machine Co, 4101 N Ravenswood Ave, Chicago 13, Ill.* New line of automatic-centering 3-arm reels is designed for the normally smaller ID's of copper, brass, bronze and tin plate coil stock. The reels hold coils up to 4000 lb, of 45-in.-max OD and 18-in.-max width. An adjustable spindle drag provides controlled uncoiling. Both plain and motor driven reels are available (Sep 8, p132).

MOTOR-DRIVEN STOCK REEL — *US Tool Co, Inc, Ampere, NJ.* Model ACR-1642 handles material up to 16 in. wide, ID's from 14½ to 22 in., max weight capacity of 2500 lb. Four cross-members expand and contract to suit the ID of coil (Jun 16, p140).

PRESS UNLOADER — *Press Automation Systems, Inc, 25418 Ryan Rd, Centerline, Mich.* Standard straight-line press unloader removes sheet metal panels or forgings from presses. Device is mounted on a portable A-frame-type mounting and is equipped with the latest Vac-Hand attachment, which has an induced-suction rubber cup design that avoids marking of panels or forgings (Apr 21, p269).

STOCK STRAIGHTENER — *Durant Tool Co, Providence, RI.* Heavy-duty model takes light or heavy stock up to ¼ in. thick and 4 in. wide and may be adapted to special widths up to 10 in. New design permits entering and starting of new stock coils through the straightening run without necessity of resetting the rolls or losing the original required stock thickness setting (Jun 30, p109).

VACUUM PLATE LIFTER—*Vac-U-Maton Div, F J Littell Machine Co, Dept 3-C, 4127 N Ravenswood Ave, Chicago 13, Ill.* Combination vacuum plate lifter and feeder lifts and moves single or multiple plate loads of 2000 to 10,000 lb by vacuum alone. The unit can be supplied with extension arms. The entire unit rides on rails and can be made semi-automatic or full automatic with remote controls (Sep 8, p138).

STOCK REEL — *U S Tool Co, Inc, Ampere (East Orange), NJ.* Model ACR-10-40 motor-driven unit is designed for material up to 10 in. in width, coils with ID from 10 to 22½ in., OD up to 40 in., weight capacity 600 lb. Model is arranged with loop control mechanism, reversing switch, and 1/3-hp motor for operation on 220/440v, 3-phase, 60-c ac (Mar 10, p174).

STOCK REEL — *Cooper Weymouth, Inc, 600 Honeyspot Rd, Stratford, Conn.* Stock reel has adjustable coil height and automatic coil centering. Reel can be tilted to any angle; this feature and the quick-acting fold-down keepers make reels particularly easy to load. Unit will take coils up to 600 lb in weight and 10 in. in width. Max coil OD is 46 in., max coil ID is 20 in.; minimum coil ID is 9½ in. (Apr 21, p191).

STRIP STOCK OILER — *Stamping Specialty Co, Inc, 2141 N Sherman Dr, Indianapolis 18, Ind.* Heavy-duty strip stock oiler, Model B, lubricates strip stock leading to a press at any desired height. It handles stock from 26 to 7 gage in widths from 24 to 72 in. Light, medium or heavy oils may be used. Oil is pumped by a ½-hp motor from a reservoir to the wool-covered steel rolls (Dec 1, p152).

DOUBLE STOCK REEL—*Durant Tool Co, Thurbers Ave, Providence, RI.* Unit can be loaded with stock on one side while the other side is unwinding. Smaller size unit handles material up to 10 in. wide on a max outside coil diameter of 44 in. and up to 500 lbs on each side. Larger model takes coils up to 1000 lbs in weight on each side with max outside stock coil diameter of 48 in. and 13-in.-wide stock (Dec 1, p154).

SAFETY DEVICE — *Goldak Co, Inc, 1544 W Glenoaks Blvd, Glendale 1, Calif.* Designed to operate on presses running at speeds up to 150 spm, device consists of a control box and detection heads which are tied in with the brake or clutch. When any metal object fails to arrive at the detection head within predetermined period of time, unit stops the press before down-stroke is completed (Apr 21, p208).

SHEET FANNER—*Magni-Power Co, Wooster, Ohio.* Sheet metal separator, available in full line of sizes and strengths, is furnished in a stainless steel case. Vertical ribs on magnetic surface offer less friction resistance. Top plate is extended and formed as a handle for easy grip. (Aug 11, p128).

PRESS CONTROL — *Tipptronic, Inc, Chagrin Falls, Ohio.* Device prevents shut-down time on high-speed punch-presses and protects against damage to presses and dies. If a "double" is fed into the die, or if a piece is unusually hard or thick, the increased current initiates control action which disengages the clutch of the press and takes away all driving energy from the ram (Apr 21, p207).

STOCK REEL DEVICE—*Jaco Devices, Inc, 90 High St, Hingham, Mass.* Coil support members of case hardened steel permit company's stock reels to handle coils as heavy as 300 lb. The supports direct the uncoiling stock in a loop to the press at whatever speed is established by the press feed (Aug 25, p110).

PRESS SAFETY DEVICE—*W I Martin & Co, 3059 W Armitage Ave, Chicago 47, Ill.* Automatic press control for protection of operator and dies on large, wide-bed presses is called the Electro-Sensitive Control Bar. Retractable trigger-bar, extending entirely across front of press, precedes ram on downstroke. If operator's hand is within danger zone, control bar automatically stops the press (Oct 20, p221).

PRESS SAFETY DEVICE—*Norwood Findings Co, Manson Ave, Providence 7, RI.* Lowcost Norwood Guard, said to insure sweep action protection of operator's hands with every press stroke, can be installed with only two bolts on practically all models of small presses. Arms are adjustable and can be easily bent to sweep over entire tool when necessary. Price is $10 (May 19, p164).

AUTOMATIC DIE STOP — *Keystone Engineering and Mfg Co, 122 SW 16 St, Des Moines, Iowa.* Unit stops material just prior to piercing, shearing or blanking operation. Device is installed by simply drilling and reaming a hole in the proper location and then pressing the stop in position. It is actuated by an adjusting screw located in the top die shoe (Jun 16, p144).

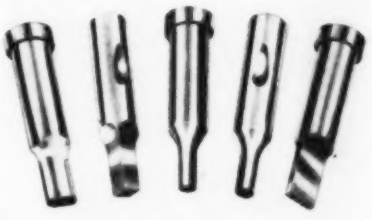
3-ARM STOCK REEL—*F J Littell Machine Co, 4101 N Ravenswood Ave, Chicago 13, Ill.* Motor-driven reel and loading car combination is designed to handle heavy coil stock of steel and tin plate. Reels take coils up to 15,000 lbs, of 54-in. max OD and 36-in. max width. Arms expand from 14½ to 17½ in. The 15,000-lb-capacity loading car has vertical lift of 16 in. (Oct 20, p206).

PRESS OVERLOAD—*Precision Welder & Flexopress Corp, 3520 Ibsen Ave, Cincinnati, Ohio.* Precision Flexostop protects high speed presses and dies against misfeed or double feeding. Device is based on the principle that the press crankshaft deflects slightly with each stroke. This in turn deflects the flywheel. If two thicknesses of stock enter die, detection is greater than normal. Flexostop detects this (on stock 0.010 in. thick and heavier) and stops machine (May 19, p154).

ELECTRONIC PRESS CONTROL — *Robotron Corp, 21300 W Eight Mile Rd, Detroit 19, Mich.* Die-Saver stops press from completing its stroke whenever stamped piece is not properly ejected from die. It is comprised of two parts: a control panel, and a detection unit which consists of a high radio-frequency coil. Ejected part passes through coil, breaking the field and closing contacts to repeat the cycle. If part fails to eject, contacts open and press stops. (May 19, p158).

DIE SETS—*Standard Die Set Co, 1505 Elmwood Ave, Providence 7, RI.* Straight-sided die sets are available in three different classes matching ASTE classifications. Class A sets are for fast presses, long runs, or heavy dies. Class B are for regular production, moderate press speeds, and/or medium weight dies; and Class C for limited production, slow presses and/or lightweight dies (Jul 14, p136).

NOTCHING UNITS—*Wales-Strippit, Inc, 200 S Buell Rd, Akron, NY.* Standard notching units for notching sheet materials up to a maximum of ¼-in.-thick mild steel are available for rectangular or "vee" edge notching; for radius notching; or in any irregular shapes within the physical limits of specific models. Standardization of punch body, punch cap, and die holder has reduced the cost of these units (Sep 22, p150).



PERFORATING PUNCHES—*Pivot Punch & Die Corp, Punch Div, North Tonawanda, NY.* Punches, made to precision standards, have concentricity tolerance of 0.002 tir between point and shank. Prices for these carbon-vanadium punches are said to be 20% to 65% lower than former prices of HSS punches. Variety of shank sizes, point sizes, and over-all lengths in both shoulder and interchangeable ball seat design (Oct 20, p216).

DIE SETS — *Lempco Industrial, Inc, Bedford, Ohio.* Die sets are equipped with special alloy aluminum ball bearing retainers which are said to add as much as 50% to life of die sets, in addition to cutting bushing weight in half. Self-aligning guide-pin bushing requires little maintenance (Dec 29, p74).

RETAINERS AND PUNCHES—*Porter Precision Products, PO Box 208, Cincinnati 15, Ohio.* This line of Bal-Lok retainers, punches, and die buttons includes both square and end retainers in light and heavy-duty series, and punches in oblong, rectangular, square and pilot styles. Also available are carbide-tipped punches and carbide-insert die buttons (Oct 20, p200).

DIE SETS — *Producto Machine Co, 990 Housatonic Ave, Bridgeport 1, Conn.* Improved die sets feature Quik-Fit guide pins that simplify and speed die set disassembly and reassembly. Spherical-angular radius on each pin makes it impossible for die set to cock or jam (Apr 21, p180).

DIE BUTTON RETAINERS—*Allied Products Corp, Richard Brothers Punch Div, 26500 Capitol Ave, Detroit 39, Mich.* Punch and die button retainer sets permit different sizes and shapes of punches and die buttons to be inserted in already mounted retainers. Each Inter-Mount set contains a master retainer and reducing retainer. Any punch size or shape can be mounted in one master retainer; die button set accommodates units with OD's from ½ to 3 in. (Jul 14, p130).

SHOULDER PUNCHES — *Allied Products Corp, Richard Brothers Punch Div, 26500 Capitol Ave, Detroit 39, Mich.* AP Series punches have round points and are made of vanadium-type tool steel. Shank diameters range from 3/16 to 1 in. and point diameters from 1/32 to 1 in. Special points and special alloys available (Feb 10, p186).

PUNCH HOLDER — *B & G Tool Co, 4610 16th Ave, Brooklyn 4, NY.* Acu-Quill holds punches or pilots accurately and positively and provides for their quick and simple replacement. Special wrench simplifies replacement of punches while dies are still in the press. Two quill sizes are available. The Q14 and Q38 will accommodate punches to ¼ and ⅜ in. respectively (Feb 24, p162).

PRESS BRAKE DIE — *O'Neil Irwin Mfg Co, 311 8th Ave, Lake City, Minn.* One Di-Acro Rol-Press die and a single punch can handle any kind of metal—and in any thickness up to ¼ in. Metals from minimum thickness to ¼ in. can be formed to any angle from 180° to as sharp as 30° in lighter gages. The roll-folding action of the die forms with less pressure and doesn't fracture the material (Apr 21, p234).

SLIDES AND GIBS—*Ohio Knife Co, Dept W-77, Cincinnati 23, Ohio.* Six standard composite sections have been added to company's line. In addition to the composite sections now used for cutoff, blanking and forming, these new sections offer many other uses, including applications for draw and pinch trim dies, heels, forming, flanging, back-up plates or as guides and hold-down gibs (Jun 16, p132).

PUNCHES—*Ring Punch & Die, Inc, 20 Fenton Pl, Jamestown, NY.* Heavy-duty solid head-type punches are available in two grades of tool steel and can be supplied in round, square, oblong or rectangular points. Odd shapes can be supplied on specification (Oct 20, p210).

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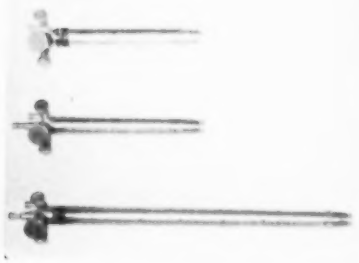
WELDING AND ASSEMBLY

SHAPE CUTTING MACHINE — *Speedi-Burn Products Co, 53¼ Linden St, West Hempstead, NY.* Unit cuts out irregularly shaped machine or weldment parts. Templet of masonite or sheet metal is used to guide cutting torch. Used for cutting steel plate from ¼ to 2 in. thick, average cutting rates of 24 ipm and 10 ipm can be achieved, respectively. Tracing head is driven through a variable speed gear-head motor (May 19, p160).

WELDING TORCH — *Harris Calorific Co, 5501 Cass Ave, Cleveland, Ohio. No.* 43 operates on high, medium or low pressures. Handle is completely solderless and all joints are sealed with O-rings. Immediate replacement of any part can be accomplished without special tools or heat assembly (Feb 24, p171).



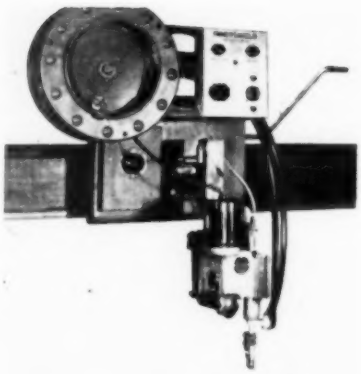
MACHINE CUTTING TORCHES—*Air Reduction Sales Co, Div of Air Reduction Co, 150 E 42nd St, New York 17, NY.* Series, designated Style 2500, is available with straight bore tip for cutting steel up to 16 in. thick, and with divergent tip for cutting steel up to 8 in. thick. Designed for use with natural gas, LPG, city gas or propane, equipment is said to operate effectively under either low or positive pressure (May 5, p158).

FLAME CUTTING MACHINE—*Distributed by Hudson Equipment Co, 515 Madison Ave, New York 22, NY.* German machine is controlled directly by 60 x 150-mm photographic glass negatives made from drawings. All preparatory work is done in the drafting room; plates and related negatives come directly to the flame cutter. Machine uses standard American tips. Tolerances of 0.040 to 0.060 in. in 32 ft are regularly maintained (Jun 16, p152).

SHAPE-CUTTING TRACER UNIT—*Linde Co, Div of Union Carbide Corp, 30 E 42 St, New York 17, NY.* The Linde Photocell Tracer permits simple pencil line sketches to be used to guide oxygen shape-cutting machines. Built-in kerf compensator provides extreme accuracy. Tracer is not sensitive to extraneous light, nor will it follow shadows. Speeds range from 2 to 30 ipm, with single or multiple-torch machines (Dec 29, p80).

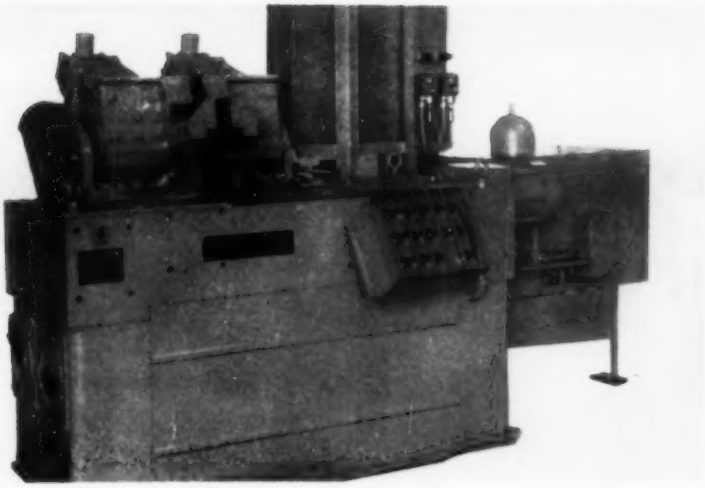
SPROCKET CUTTING MACHINE — *Western Conveyor Co, Box 357, Boise, Idaho.* Schrock Thermo-Cut can cut roller chain sprockets from 4 in. to 90 in. in diameter, 4 tooth and up. Setup and cutting time are minimized. Special shapes can be cut through the use of specially designed cams. Tolerances can be held to within 0.010 in. (Dec 1, p144).

WELDING MACHINE — *Lincoln Electric Co, Cleveland 17, Ohio.* Lincolnweld ML-3 machine is a mechanized unit which provides automatic wire feed, flux flow and travel speed, but permits manual guiding of the welding arc. Gun is moved along joint at a preset speed by a small motor. Speeds up to 70 ipm (using up to 600 amp) are possible. The machine can be used on materials ranging in thickness from 10 gage up (Apr 7, p134).



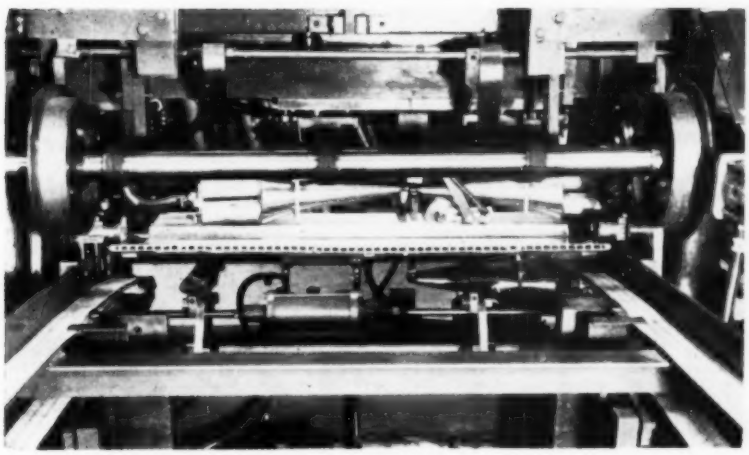
AUTOMATIC WELDING — *Lincoln Electric Co, Cleveland 17, Ohio.* New process, called Innershield, arc welds steel at speeds up to 300 ipm. Process uses flux-containing, coiled wire electrode that produces a vapor shielding for an open arc. Equipment includes welding head that controls electrode feed and a motor-generator power source that supplies 400 to 1000-amp welding current. Process will make welds ranging from lap welds in 16-gage material to butt welds in ½-in. plate (May 5, p150).

ULTRASONIC WELDER—*Aeroprojects Inc, West Chester, Penna.* This 2000-watt, semi-portable ultrasonic welder, the W-2000-SR-57-10 Sonoweld, is a spot-type welder that can be operated on an ordinary 230-v circuit. It can join similar and dissimilar metals without fusion, and with very little external deformation. The operator places work to be welded between two welding members and activates a foot switch to initiate the entire weld cycle (Sep 22, p134).



AUTOMATIC FLASH WELDER — *Federal Machine & Welder Co, Warren, Ohio.* Model F5 is one in a new line of automatic flash welders. This 400-kva unit is designed for flash welding hot-rolled-steel rings ⅜ in. thick and up to 8 in. wide. It can also handle flat stock. Upset force of nearly 38,000 lb is derived from a double-acting hydraulic cylinder (Jun 28, p110).

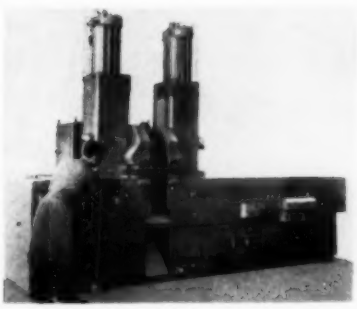
BENCH WELDER—*Eisler Engineering Co, Inc, 750 S 13 St, Newark 3, NJ.* Press-type bench welder, suitable for welding small parts for the electronic industry, is capable of making 35 to 50 different welding combinations simply by changing the welding tips. Welders are available in 1, 2, 3 and 5-kva sizes (Sep 22, p154).



COIL SPLICING WELDER—*E W Bliss Co, Canton, Ohio.* Automatic machine handles 99%-pure copper coils up to 37.5 in. wide. Tail end of lead coil is centered, clamped and sheared, then end is swung up out of way and lead end of next coil is handled the same way. Shear and welding clamp assembly moves into position, and the machine builds one 6000-ft coil out of three 2000-ft coils (Feb 24, p144).

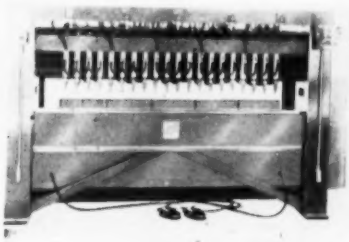
ULTRASONIC WELDER — *Gulton Industries, Inc, Metuchen, NJ.* Automated, continuous-seam, ultrasonic welding machine is capable of welding sheet metal from 0.080 in. thick down to very fine foils. It will join any two dissimilar or similar metals. The piece to which sheet is to be welded can be five inches thick or more if necessary, because machine operates from only one side of joint (Mar 10, p166).

METAL GRATING WELDER—*Klemp Metal Grating Corp, 66087 Melvina Ave, Chicago 38, Ill.* Automatic welding machine fabricates metal grating. It is shop-built on a 125-ton Verson hydraulic press, supplied with four resistance welding transformers, totaling 1200 kva, and eight point tap switch heat regulators. Hydraulic indexing unit assures positive cross-bar spacing. Machine welds gratings up to 36 ft long by 36 in. wide (Feb 24, p144).



AUTOMATIC FLASH WELDER—*Imported by Asea Electric Inc, 500 Fifth Ave, New York 36, NY.* Type SVU is equipped with hydraulic clamping and motor-operated upsetting, and has maximum welding section capacities of up to 40 sq in. Automatic control, operated through weld temperature and slide distance, permits predetermination of exact welded length and maintains uniformity of welds when abutting surfaces are uneven (Dec 15, p137).

ULTRASONIC FOIL WELDER—*Gulton Industries, Inc, 212 Durham Ave, Metuchen, NJ.* The ultrasonic aluminum foil welder is designed as a hand unit and is powered by a 100-w ultrasonic generator. Welder has been tested successfully on aluminum foil down to 0.0003 in. Simple to use, the unit produces sealed joints which would make it possible to seal products airtight in aluminum envelopes. It operates at 20,000 cycles (Jun 30, p107).



WELDING PRESS—*Combined Welder & Machine Corp, 75-50 Grand Ave, Maspeth 78, NY.* Welding press can be used for multi-spot, multi-projection, and multi-cross welding, brazing, hot upsetting and mash welding (Feb 24, p156).

AUTOMATIC WELDING MACHINE — *Tri-City Tool & Machinery Corp, PO Box 404, Rock Island, Ill.* Machine welds collars on each end of a tube at the rate of 360 welds per hr. Operator merely loads and unloads parts. Welding unit is a General Electric inert-arc unit, using 0.045-in. electrode at 72 ipm. Machine can also be used as a multiple-station indexing plate (Feb 10, p162).

WELDER ATTACHMENT — *Hobart Brothers Co, Hobart Square, Troy, Ohio,* Attachment, for factory installation only on company's motor-generator arc welders, is designed for critical TIG welding applications where extremely low ripple (1 to 2%) dc welding current is required to weld such metals as stainless steel, high carbon steel, cast iron, silicon bronze, deoxidized copper and silver (Jan 13, p168).

DC ARC WELDING MACHINES—*Air Reduction Sales Co, 150 E 42 St, New York 17, NY.* Latest additions to company's line, these machines include an Aircomatic Fillerarc welder designed especially for consumable-electrode, gas-shielded welding processes; two models of the Hornet 36B motor generators for both metal-arc and inert-arc welding; and two models of the Yellow Jacket water-cooled engine driven welder (Sep 8, p136).

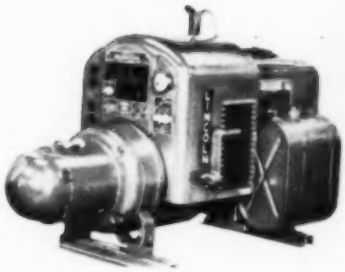
PORTABLE WELDER — *Wall Colmonoy Corp, 19345 John R St, Detroit 3, Mich.* Semi-automatic welder is designed for rapid, accurately controlled application of hard-facing wire electrode. Features include a 14-ft flexible shaft for greater working range, and a double-range arc-length control circuit for greater operating range and better welding control. Model operates from any welding machine 300 amps or larger (Jun 2, p128).

WELDING OUTFIT — *Hobart Bros Co, Hobart Square, Troy, Ohio.* This ac-dc inert-gas-shielded arc welder is equipped with a Circoolator (a water tank with motor driven pump), and is designed for large operations where the welding machine is needed at different stations. Unit is available with solid rubber or steel wheels and is knocked down for shipment (Jan 13, p166).

MANUAL WELDING UNIT — *Air Reduction Sales Co, Div of Air Reduction Co, Inc, 150 E 42 St, New York 17, NY.* Manual unit for Aircomatic or inert-gas-shielded arc-welding process provides new type of wire feeding system to handle broadest range of wire types and sizes. Both "push" and "pull" guns are available to cover range of wire types and sizes from 0.020 in. hard to ⅛ in. aluminum. Equipment is portable (Mar 24, p158).

UTILITY WELDER — *Miller Electric Mfg Co, Appleton, Wis.* Model M-180-P, 137-lb unit, has continuous, precise current control provided by new movable shunt regulator. Standard equipment includes 6 ft of 3-conductor primary cable with 3-prong plug and wall receptacle; 20 ft of No. 4 electrode cable with holder 15 ft of No. 4 ground cable with clamp; welding helmet, and 5 lbs of assorted electrodes (Feb 10, p158).

WELDER—*Miller Electric Mfg Co, Appleton, Wis.* Combination AC-DC transformer-rectifier welder, Model 180 Twin, delivers two ac ranges, 20-115 and 60-180 amps, and one dc range of 60-150 amps (Oct 6, p131).



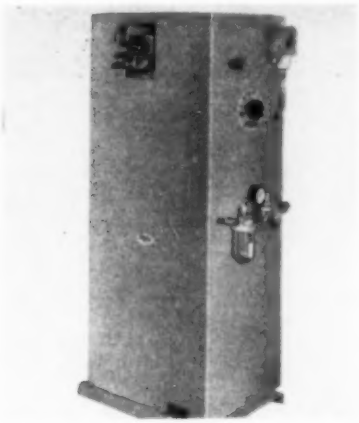
WELDER-GENERATOR — *Lincoln Electric Co, Cleveland 17, Ohio.* Combination Weldanpower provides 115 or 230-v, 60-c ac single phase power. It is rated 5 kva, continuous duty, and will start and run motors up to 3 hp. Speed, when used as power supply unit, is 1820 rpm. Unit supplies 20 to 200 amps of ac welding current for maintenance welding and hard-surfacing; it handles 5/64- through 3/16-in. electrodes (Nov 17, p259).

ARC WELDERS—*Air Reduction Sales Co, 150 E 42nd St, New York 17, NY.* Drooping-voltage arc welders are available in three types—250-amp dc, 300-amp ac/dc, and 300-amp ac/dc Heliwelder. All machines are air cooled and engine driven, and provide 115/230-v, 10-kw, single-phase, 60-cycle power when operated as power plants. They have 115-v, 1-kw dc auxiliary power available for operating lights and power tools while welding (Sep 22, p146).

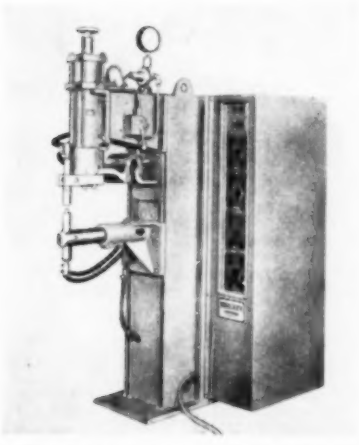
MULTI-ARC WELDING—*A O Smith Corp, Welding Products Div, Milwaukee, Wis.* Multi-arc welding system makes use of the new 750 or 1500-amp, dc, constant-potential power sources in conjunction with series resistance grids to accommodate arc welding, tack welding, stud welding, arc air gouging and inert arc welding (May 5, p152).

AC-DC ARC WELDER — *Hobart Brothers Co, Hobart Square, Troy, Ohio.* Arc welder can also be used for inert gas welding. Welding with either ac or dc (straight or reverse polarity) is accomplished by shifting a selector switch. Model AD-264-S is rated 200 amp at 40v, has welding range of 12 to 330 amp ac, 12 to 360 amp dc. Model AD-364-S is rated 300 amp at 40v, has welding range of 12 to 420 amp, ac, 12 to 400 amp dc (Feb 24, p158).

WELDER—*Hobart Brothers Co, Hobart Square, Troy, Ohio.* The Budget 500, a lowcost AC transformer-type arc welder, is rated 500 amps, at 40 volts, on 60% duty cycle. It has a range of 100 to 625 amps in three overlapping main step settings of 100 to 300, 195 to 475, and 375 to 625 amps. These coarse adjustments steps, with rheostat for fine adjustment, permit choice of open circuit voltage to suit the job at hand (Dec 1, p149).

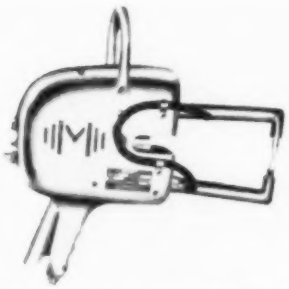


BUTT WELDER—*Alphil Spot Welder Mfg Corp, 1058 Pacific St, Brooklyn 38, NY.* Model BW air-operated butt welder, making up to 2500 welds per hr, is designed for welding wire rings, rectangulars, flats and angles in both cold-rolled and hot-rolled materials. Each jaw has an independent cylinder. Step-in die permits fast alignment for welding wires ranging from 1/16 to ½ in. dia with same jaw setting (Oct 6, p132).



SPOT WELDER — *Sciaky Bros, Inc, 4915 W 67th St, Chicago, Ill.* Model SP-1 spot welder, an air-operated, press-type unit designed to cover a wide range of commercial welding applications, is available in 30, 50 and 75-kva ratings at 50% duty cycle. The SP-1 can be furnished with 18, 24, 30, 36 and 42-in. throat depths. Electrode force up to 1575 lb is provided at 80-psi line pressure (Jan 13, p164).

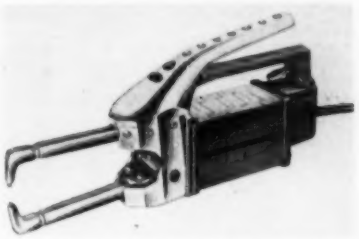
HELIARC WELDING TORCH—*Linde Co, 30 E 42nd St, New York 17, NY.* Cooling water passages are molded in the torch head of HW-18, providing freedom from leakage. The lighter, smaller, more-rugged torch body is made of Fiberglas-reinforced phenolic reported to have exceptional heat resistance. New gas cups have improved thermal shock and heat resistance, with impact strength four times greater than usual ceramic cups (Jun 2, p122).



SPOT WELDER—*Merit Co of Chicago, 2124 W Chicago Ave, Chicago, Ill.* Outstanding features include an automatic electronic timer and contactor to give consistent welds; welding capacity up to 3/16-in. combined thickness on a wide variety of metals; and linkage device that permits variable tip pressure of zero to 1000 lb. Unit is available in air-cooled and water-cooled models; both 8⅝ in. high, 18½ in. long, and weighing 28 lb (Sep 8, p134).

WELDING GUN—*Hobart Brothers Co, Hobart Square, Troy, Ohio.* Air-cooled gun for use with Hobart's Migarc process (metal inert-gas shielded arc welding using carbon dioxide as arc shield) is lightweight, and eliminates need for water hoses and connections. Gun, control, and wire-feed unit are portable or can be separated into components for mounting for single station operation (Jul 28, p106).

SPOT PANEL WELDER — *Schott Metal Products Co, 2225 Lee Rd, Akron 6, Ohio.* Spot welding from one side of the work without distortion or backup can be accomplished with new unit designed for use with any welding machine, ac or dc, of 125 amps rating or more. Special powered-iron-coated welding rod with starting tip arcs immediately on contact with work. Rods are available in 1/16 and 5/64-in. dia (Nov 3, p144).



PORTABLE SPOT WELDER—*Peer, Inc, Benton Harbor, Mich.* Rex Junior portable spot welder, designed for small sheet metal shops, garages and general maintenance work, has a fixed top tong, permitting operator to rest weight of the welder on the exact welding spot for added contact pressure. Unit weighs 24 lb and welds mild steel, stainless, galvanized iron and terneplate (Sep 22, p142).

SPOT WELDER—*Sciaky Bros, Inc, 4915 W 67 St, Chicago, Ill.* Model SR O rocker-arm spot welder features an unusually rigid frame, and transistorized controls with plug-in components. Lowcost unit is available in standard "O" frame, with 30 or 50-kva transformer. Throat depth can be varied by a choice of six arm lengths, ranging from 12 to 42 in. (Jun 2, p118).

WELDING TORCH—*Arcair Co, PO Box 431, Lancaster, Ohio.* Manually operated Model H-2, designed for small shop use, has positive air control valve in the torch handle. By holding the air orifice in the head of the torch within 4 in. of the work, unit can be operated on as low as 40 psi of compressed air. Model is priced at $49.50 (Nov 17, p251).

SPOT WELDER—*Alphil Spot Welder Mfg Corp, 1058 Pacific St, Brooklyn 16, NY.* Model A-R resistance spot welder is designed for the sheet-metal, wrought-iron and wire fabricating industries. Machine has a current capacity of 75 kva, adequate for welding 16-gage commercial aluminum and 7-gage cold rolled steel. Maximum short-circuit secondary current is 26,000 amps (Jun 2, p130).

HIGH-TENSILE ELECTRODE—*Lincoln Electric Co, Cleveland 17, Ohio.* Jetweld LH-90 and Jetweld LH-110 are new iron powder, low-hydrogen types designed for making high-strength joints in alloy steels. The former is classed E-9018 and also meets requirements of E-8018-B2; the latter is classed E-11018 (Sep 8, p130).

ELECTRODE—*Stoody Co, Whittier, Calif.* Electrode called Build-Up (iron powder coating) for manual application is said to have high tensile strength, resistance to cold flowing under compressive load, high impact strength, low tendency to work hardening, and limited increase in hardness under severe quench. Operating either ac or dc (either polarity), weldability is excellent, spatter loss low (Oct 6, p136).

ELECTRODES — *Air Reduction Sales Co, 150 E 42nd St, New York 17, NY.* Easyarc 308, 316 and 347 are reportedly the first powdered-metal stainless electrodes ever offered. Features of the ac-dc units are described as: unprecedented footage per electrode; well formed beads; and excellent restriking characteristics (Jun 16, p150).

WELDING ELECTRODES — *Lukens Steel Co, Coatesville, Penna.* Electrodes, designated Plate-Mate, are specifically matched to the company's line of alloy, alloy-clad, and carbon steel plates. Electrodes are available in a complete range of packagings, from a 5-lb pack of stainless rods to a 750-lb pack (Aug 11, p126).

ELECTRODE — *Air Reduction Sales Co, Div of Air Reduction Co, Inc, 150 E 42 St, New York 18, NY.* Easyarc 30 is a mild steel iron-powder-type electrode designed for fabrication of large weldments such as structural frames and machine bases. As-welded properties include tensile strength of 63,650 psi; yield strength, 52,400 psi; elongation (in 2 in.) of 33%; and a 49.9% reduction in area (Jan 13, p168).

WELDING ELECTRODE — *Lincoln Electric Co, Box 3115, Cleveland 17, Ohio.* Fleetweld 7MP is an E-6012 type classed as an all-position, ac or dc, mild steel electrode. The iron powder in the electrode coating is reported to simplify and speed operation. Electrode is available in 1/8, 5/32 and 3/16-in. sizes (Aug 25, p115).

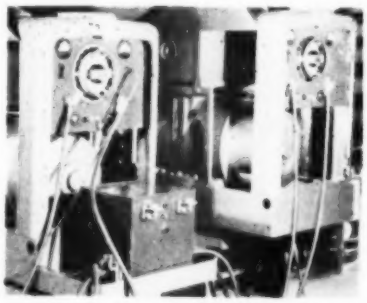
HARD-SURFACING ELECTRODE — *International Nickel Co, 67 Wall St, New York 5, NY.* Inco-Hard 1 provides a hard surface overlay for low-alloy steels and cast irons where severe abrasive conditions are present. The deposit is structurally similar to Ni-Hard nickel-chromium alloy. Electrode is available in diameters of 5/32, 3/16 and 1/4 in. (Jun 16, p150).

WELDING WIRES — *Kaiser Aluminum & Chemical Sales, Inc, 919 N Michigan Ave, Chicago 11, Ill.* Bright welding wire, King Brand, is available in a broad range of alloys for MIG (metal inert gas) aluminum welding processes. Bright surface 5183 alloy welding wire meets the ultra-high strength welding requirements of Kaiser's 5083 alloy sheet and plate. Electrodes for TIG (tungsten inert gas) welding processes are available in the same alloys (Jun 16, p149).

WELDING WIRE—*A O Smith Corp, Welding Products Div, Milwaukee, Wis.* Stainless steel welding wire and an expanded line of manual and automatic hard surfacing electrodes have been added to line of welding accessories. Wire is offered in coils, spools, and straightened and cut lengths. The electrode line consists of 19 manual types and seven tube-type wires for semi-automatic and automatic applications (Sep 22, p161).

COPPER COATED WELDING WIRE —*American Chain & Cable Co, Page Steel & Wire Div, Monessen, Penna.* Page A-S-18 welds steels from AISI-1025 to AISI-1045. When used with carbon dioxide gas welding processes or with a neutral flux submerged-arc procedure on 0.35% carbon steel joints, wire imparts a tensile strength of 75/81,000 psi, yield strength of 55/61,000 psi, and an elongation of 24% (Sep 22, p160).

WELDING WIRE — *International Nickel Co, 67 Wall St, New York 5, NY.* Inco-Weld A produces strong, ductile joints in a large number of dissimilar metal combinations. Features include excellent operability in all positions, high-strength and corrosion-resistant deposit, machinability, high impact resistance, good elevated-temperature properties, and X-ray quality welds. Wire is good for overlay applications (Jun 16, p170).



PARALLELING ATTACHMENT—*Hobart Brothers Co, Troy, Ohio.* Completely enclosed in a 13 x 16 x 15-in. steel case, attachment simplifies the paralleling of two arc welders when it is desired to use their combined capacity for such work as automatic welding, arc cutting, stud welding, etc. Attachment can be used with any Hobart electric, gasoline or diesel-powered, rotating-type dc welder rated for 60% duty cycle or higher (Nov 3, p134).

WELDING POSITIONER—*Raco Engineering Service, 2116 Chestnut Ave, Alhambra, Calif.* RA-100 has capacity of 100 lb. Variable-speed drive system is enclosed. Turntable, provided with a manual tilt device, is 12 in. in dia. Five speed ranges are available; the 0 to 1.41 rpm range for manual welding of steel or low-speed aluminum welding; ranges from 0 to 10.5 rpm for high-speed automatic welding (Jun 30, p120).

WELDING CABLE REEL — *United Specialties, Inc, El Dorado, Ark.* Self-retracting unit is designed to hold 50 ft of 2 0 cable. It has a current capacity of 300 amps with 60% overload factor. Reel, designated Weldreel Model EA2, is easily mounted on wall, floor, ceiling, or mobile equipment (Nov 17, p270).

WELDING DIE ADAPTER—*P R Mallory & Co, Indianapolis 6, Ind.* New design of the Nu-Twist die adapter makes it possible to make two or more resistance welds simultaneously on the same machine, with welding pressures and current equalized on each weld. Electrode inserts for projection welding, spot welding, and electrical upsetting can be switched in seconds (Nov 3, p132).

POWER ROLL—*Pandjiris Weldment Co, 5151 Northrup Ave, St Louis 10, Mo.* New design incorporates use of an individual drive motor for each roll assembly on the power roll. Individual drives consist of ac constant speed squirrel cage motors with variable speed obtained through use of magnetic slip couplings. Driving power is furnished from alternating current (Jul 14, p140).

ACETYLENE GENERATOR — *Linde Co, Div of Union Carbide Corp, 30 E 42nd St, New York 17, NY.* Oxweld MP-11 with carbide capacity of 500 lbs will produce 1000 cu ft of medium-pressure acetylene per hour. Automatic signal system consists of a howler and indicator lights that provide audible and visual warning if minimum carbide supply, water level, or water temperature deviate from normal (Feb 24, p161).

WELDER CONTROLLERS—*Square D Co, 4041 N Richards St, Milwaukee 12, Wis.* Line of non-synchronous electronic combination welder controllers is designed to give the performance required on high speed production lines and the flexibility to meet changes in materials and designs. Flexibility and simplified maintenance are achieved by functional breakdown of the control into individual panels for sequence timing, power supply, valve operation and contactor firing (Jul 14, p125).

ELECTRODE HOLDERS — *Tweco Products, Inc, PO Box 666, Wichita 1, Kan.* Electrode holders, designated Twecotongs, feature ball-point-type cable connection. Welding cable can be connected in less than two minutes. By eliminating the use of shim stock and a pressure plate, the connection allows use of larger cable sizes (May 19, p180).

WELDING CLAMPS — *Aronson Machine Co, Arcade, NY.* Magnetic clamps, called Twinners, can be used singly or in groups, either for setting up on the welding table or for holding work in position. They are reportedly powerful enough to hold the work for tacking up, and easily removed when job is finished (Feb 10, p186).

WELDING TABLE — *Challenge Machinery Co, Grand Haven, Mich.* Table with cast slots is suitable for precision welding operations and the positioning of other units during hand tooling or assembly operations (Apr 21, p285).

ARC-TIME METER — *Machinery & Welder Corp, 700 S Spring Ave, St Louis 10, Mo.* Arc-Timer accurately records duration of arc of any welding machine, ac or dc, whose open circuit voltage does not exceed 110 volts. Meter is cumulative so that arc operation between 15 and 45 volts may be recorded by job, hour, week or any prescribed period (Jun 16, p147).

PASTE-TYPE SOLDER ALLOY — *Fusion Engineering Co, 17921 Roseland Ave, Cleveland 12, Ohio.* Series CW, developed primarily for use in a completely new, automatic soldering process, incorporates special binders and fluxes together with finely divided pure solder alloys to form a stable paste. Paste can be automatically or semi-automatically applied to part prior to soldering through special dispensers located in production line (Feb 24, p154).

ALUMINUM SOLDER—*Air Reduction Sales Co, 150 E 42nd St, New York 17, NY.* Airco 720 Al-Solder Rod for soldering aluminum requires no flux, no washing, no wire brushing; precleaning and post-cleaning are unnecessary. It is applied by rubbing across joints that have been heated. Melting and wetting takes place 400 to 500 degrees below the melting point of the aluminum, at a temperature of 720 F (Sep 22, p164).

ALUMINUM SOLDERING FLUX — *American Solder & Flux Co, 19th & Willard Sts, Philadelphia 40, Penna.* Material may be used to join aluminum to itself or to other metals. Capillary action is so pronounced that it is reportedly possible to draw the solder between two pieces of aluminum even when held in a vertical position. Operating temperature is from 600 to 675 F (Jun 2, p136).

BRAZING STOP-OFF MATERIAL — *Wall Colmonoy Corp, Stainless Processing Div, 19345 John R St, Detroit 3, Mich.* Nicrobraz material, designated White Stop-Off, acts as a parting compound to prevent the brazing of not-to-be brazed mating surfaces during furnace brazing operations. Supplied as a powder, it is mixed with a volatile plastic called Nicrobraz Cement to facilitate application (Feb 24, p149).

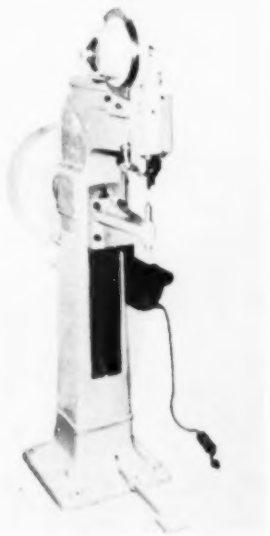
BRAZING ROD—*American Brazing Alloys Co, PO Box 11, Pelham, NY.* Nickel silver brazing rod, high-tensile Ambraze No. 111, is furnished uncoated in five diameters (1/16 to ¼ in.) and in four diameters with flux coating (3/32 to ¼ in.). Recommended for fabrication of small parts, and repair of machine tools, rod can be used in place of costly silver solders and reportedly offers higher strength when more heat is permissible (Jul 14, p139).

LIGHTWEIGHT RIVETING TOOLS —*Pop Rivet Div, United Shoe Machinery Corp, West Medway, Mass.* The powered tool, designated the PRG Hydraulic Gun, will pull Monel rivets up to 3/16 in. in diameter. The hand riveter, PRP Model B, just slightly larger than household pliers, can set aluminum rivets of 3/32, ⅛ or 5/32 in. diameter, and Monel or steel rivets up to ¼ in. (Sep 8, p134).

RIVETING MACHINE—*Milford Rivet & Machine Co, Milford, Conn.* Designed to handle and set long tubular and semi-tubular rivets in products fabricated or molded of metal or plastic, the Model 423 sets rivets up to ¼ in. in diameter and 2⅜ in. long. A blade-type hopper provides continuous rivet feed. Throat depth is 12 in.; stroke is 5 in. Over-all height is 78¾ in. Motor is 1/3 hp, 1140 rpm, 60 cycle, 110 volt (Sep 22, p142).

PNEUMATIC RIVETERS — *Milford Rivet & Machine Co, Milford, Conn.* Machine sets tubular steel rivets up to 5/32-in. dia and ¾ in. long on centers as small as ⅝ in. Units can be used in conjunction with inline slide fixtures or rotary transfer tables for progressive, high speed production assembly operations and can also be used as bench or pedestal models in job shop applications (Mar 24, p170).

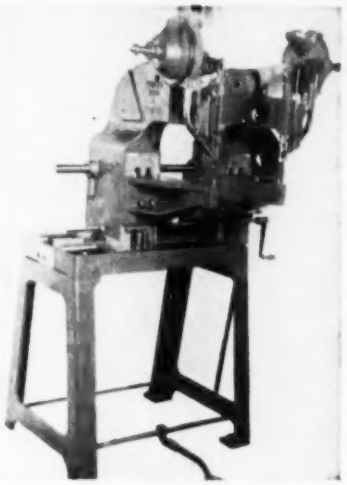
RIVET SHAVER—*Boeing Airplane Co, Seattle, Wash.* Dual-rotation rivet shaver shaves the heads of stainless and titanium rivets. Tool has standard 1-in. arbor, tungsten-carbide rotary file that moves in two axes. Two-axis movement provides better finish. File is driven at 4180 rpm by a ¼-in. portable air-drill motor. Closeness of shave is easily controlled (Mar 24, p101).



AUTOMATIC RIVETER—*Townsend Co, PO Box 237-Z, New Brighton, Penna.* This rivet setting machine handles tubular rivets ranging in size from 3/32 to 3/16 in. in diameter and up to 1 in. long. It is designed to handle a wide variety of work. Anvils of all lengths are available (Oct 20, p216).

TEMPERATURE SENSING RIVETER—*Boeing Airplane Co, Seattle, Wash.* Temperature sensing control for automatic riveter insures that rivet is driven automatically when the correct heat is reached. Control senses correct riveting temperature by the yield point of the rivet (Feb 24, p140).

EYELETTING MACHINE — *Edward Segal, 72 Spring St, New York 12, NY.* Model NR-ESSM eyelet setting and soldering machine is designed to fuse eyelets in place on printed circuit boards so as to assure a continuous electrical circuit on opposite sides of board. In one automatic operation, the eyelet is staked and resistance soldered. Production in excess of 30 eyelets per minute is easily maintained (Apr 21, p193).



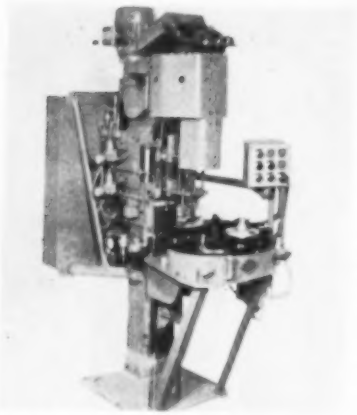
RIVETER — *Tubular Rivet & Stud Co, Wollaston 70, Mass.* Model 109 double-drive, adjustable-center riveter automatically feeds and sets two large-dia (up to 0.200 in.) rivets at one time. Max rivet length is 1 in. Throat depth is 12 in.; center distance is adjustable from ⅝ to 16 in.; stroke is 2 or 2¾ in. Rivets may be of different styles and lengths (Apr 21, p181).

AUTOMATIC RIVETING MACHINES — *Milford Rivet & Machine Co, Milford, Conn.* Model 250 single-spindle heavy-duty riveter feeds and sets primarily 3/16-in. dia semi-tubular rivets in lengths from 3/16 to 1 in. Other machines include Model 423 single-spindle machine designed to feed and set 3/16 and ¼-in.-dia rivets up through 2¾ in. long; Model 56 pneumatic driver with a max semi-tubular rivet capacity of 5/32 in. dia by ¾ in. long; and the Model 54 bench riveter (Apr 21, p186).

TERMINAL BOARD RIVETER—*Hill Machine Co, 1311 Eddy Ave, Rockford, Ill.* Machine is designed for spin-riveting of turret-type terminals in any selected arrangement. Once set, the machine will deliver absolute uniformity of riveting on each terminal, requiring no special skill or judgment on part of the operator (Oct 20, p214).

POWDER-ACTUATED STUDGUN — *Ammo Products, Inc, 1100 20th St NW, Washington, DC.* By using three interchangeable barrels the Ammo studgun eliminates the need for separate tools for various sizes of pins. This unit, which combines the functions of light, medium and heavy-duty models, can handle all types of fastening requirements and can drive all sizes of pins including the 5/16-in. pin (May 5, p168).

PORTABLE METAL STAPLER—*Bostitch, 2002 Briggs Drive, East Greenwich, RI.* Model P-10 portable metal stapler staples steel, copper, aluminum, rubber, plastics, fibers and similar materials, like-to-like or in combinations. It uses pre-formed staples of high tensile strength. Machine is air operated. When fastening metals, stapler handles max combined thickness of approx 0.080 in. of steel (Jul 14, p119).



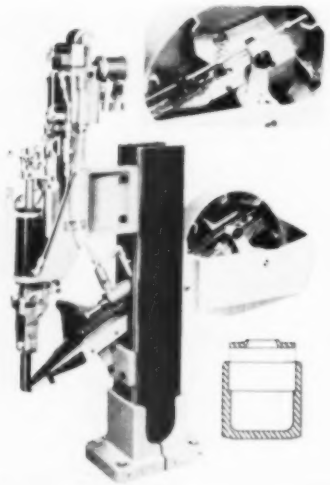
MULTI-SPINDLE SCREWDRIVER — *Gray Equipment Co, 13600 Ford Rd, Dearborn, Mich.* Machine has individual spindle torque control. The machine, designed to drive all the screws at the same time, is used in high production fastening operations. A dial indexing table positions the workpieces; the overhead oscillating magazine feeds the screws to the spindles (Aug 11, p136).

HYDRAULIC POWER SYSTEM — *Thor Power Tool Co, Prudential Plaza, Chicago 1, Ill.* Thor-Draulic hydraulic system for multiple nutsetting and other multiple power tool operations delivers uniform torque to plus or minus one foot-pound simultaneously to as many threaded fasteners as it is set up to drive. System is designed for multiple setting of as many as 20 threaded fasteners of various sizes and bolt patterns (Apr 21, p185).

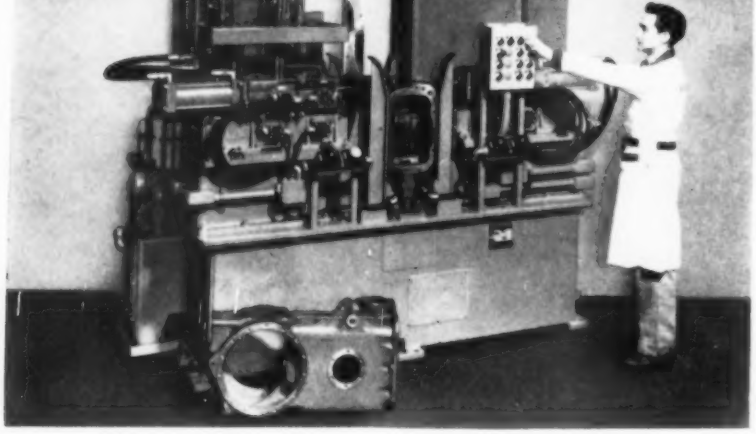
ROTARY ASSEMBLY MACHINE — *Ferguson Machine Corp, Roller Gear Div, 7818 Maplewood Industrial Court, St Louis 17, Mo.* Rotary transfer machine has an integral pressing station for crimping, riveting, staking and forming operations in conjunction with automatic assembly, or for dial-fed secondary press operations in the manufacture of small parts. 24- or 36-in. dials are available with 6, 8, 12 or 16 stations (Dec 29, p75).

TUBE PIN STAKER — *Edward Segal, 72 Spring St, New York 12, NY.* Model NRTP tube pin and turret terminal setting machine is designed to feed and stake these parts into printed circuit boards. Parts are hopper fed to a transfer mechanism where each piece is individually engaged in a holding mechanism. Production rate of 40 per minute is easily maintained (Apr 21, p254).

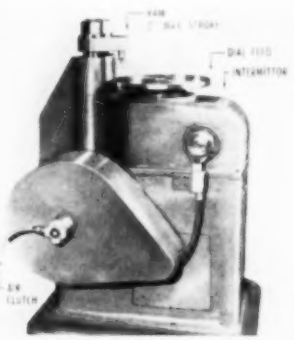
SETSCREW DRIVING MACHINE — *Standard Pressed Steel Co, Jenkintown, Penna.* This automated setscrew driving machine, designated Setomatic, can insert and drive home up to 2500 fasteners per hr, well in excess of maximum demands of the fastest mechanical assembly lines. Unit can be attached to a single machine or introduced into a complete assembly line (Apr 21, p238).



ASSEMBLY MACHINE—*Diron Automatic Tool, Inc, 2300 23rd Ave, Rockford, Ill.* Improved Auto-Positioner incorporates a newly developed parts feeder. Designed to handle piece parts ranging from 1/16 to 2 in. approximate size, the positioner transfers the parts from the feeder to fixture at speeds up to 6000 per hr. A sensing mechanism stops the machine if a part is missing or malformed (Oct 20, p212).



BOLT DRIVING UNIT—*Gray Equipment Co, 13600 Ford Rd, Dearborn, Mich.* Five Sem-type bolts are driven simultaneously to close torque requirement limits with this machine developed for high production semi-automatic applications. Design is available as a multiple-spindle bolt driving head for completely automated production lines. Bolts are fed by an elevator hopper feeder (Sep 22, p142).



ASSEMBLY UNIT—*Ferguson Machine Corp of Indiana, 7818 Maplewood Industrial Court, St Louis 17, Mo.* High speed index table is available integrated with a dieing machine press. Known as the Pressembler, unit is designed for automatic assembly operations which include a press function. Line includes dials up to 18 in. in dia with 4, 6, 8, or 12 stations on presses with capacities from 5 to 15 tons and strokes from ½ to 2 in. at speeds over 200 spm (Dec 1, p140).

SCREW AND NUT DRIVER—*Diron Automatic Tool, Inc, 2300-23rd Ave, Rockford, Ill.* Auto-Torque Driver consists of the parts positioner head, a compact air-motor drive for the spindle, and a newly developed parts feeder which requires no auxiliary motor or vibrator. Clutch is furnished in two torque ranges to provide for high and low torque requirements: 5 in.-oz to 84 in.-lb, and 48 to 120 in.-lb (Dec 1, p152).

AUTOMATIC INSERTING EQUIPMENT—*Heli-Coil Corp, Danbury, Conn.* Among the company's new items are an automated assembly unit for insertion of Heli-Coil inserts, a high-speed inserting tool, a hopper feed unit, and special power tools (Oct 20, p194).

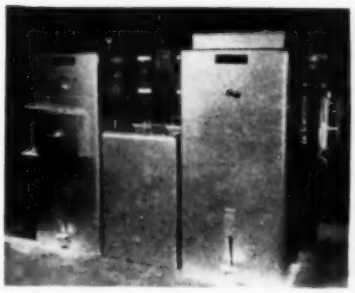
CIRCUIT BOARD ASSEMBLER — *Design Tool Corp, Electro-Machinery Div, 80 Washington St, New York 6, NY.* Automatic auto-board, designed for the electronics industry, positions circuit boards, drills holes, selects components, and inserts the components in proper sequence. Information is fed to machine on punched tape (Feb 24, p156).

ASSEMBLY MACHINE—*Expert Automation Machine Co, Division of Expert Die & Tool Co, Inc, 17144 Mt Elliott Ave, Detroit 12, Mich.* Machine inserts and burnishes bushings in one operation by means of a double-acting tool slide arrangement. Tractor center housings are manually loaded, accurately clamped in position; split bushings are manually loaded on opposed burnishing tools. Production is 62 housings per hr at 80% efficiency (Nov 3, p130).

American Machinist 1959 PRODUCTION PREVIEW

HEATING AND HEAT TREATING

ANNEALING FURNACE — *American Gas Furnace Co, Elizabeth, NJ.* Model 264 reciprocating furnace is one model in a new line of reciprocating furnaces designed for the bright annealing and bright hardening of small stainless steel parts at temperatures up to 1900 F. This model has a capacity of approximately 100 lb of parts per hr (Oct 20, p195).



HEAT-TREATING FURNACE—*Waltz Furnace Co, Dept E, 1901 Symmes St, Cincinnati 6, Ohio.* Three-section furnace provides complete heat-treating facilities for small tools. The wide temperature range and accurate controls enable furnace to handle every type of high-speed steel including the cobalt type. Furnace is made up of a preheat furnace, a drawing furnace, an atmosphere generator, and two quench tanks, one for oil and one for water (Sep 8, p134).

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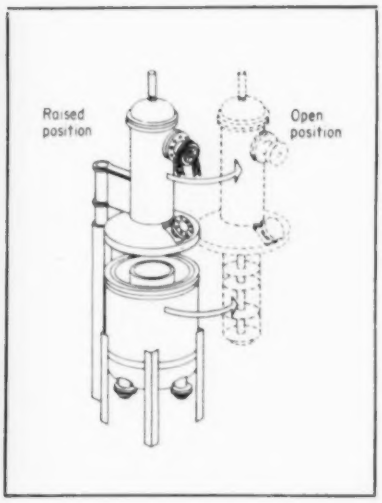
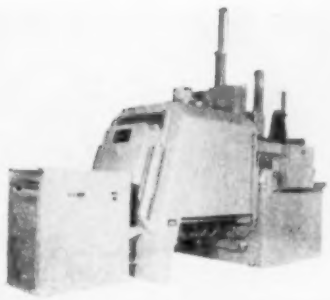
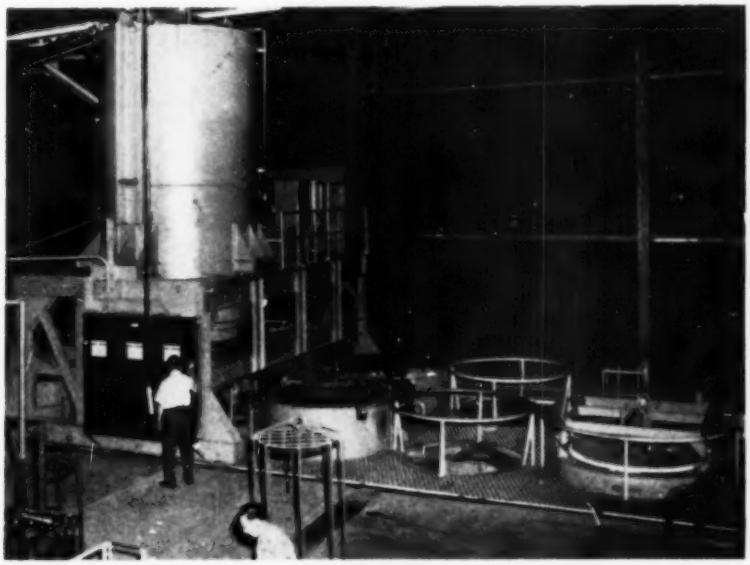
VACUUM HEAT-TREATING FURNACE—*C I Hayes, Inc, Cranston, RI.* Furnace has a heating chamber of heat-reflecting steel surrounded by water jacket. Inside the chamber there is a set of reflective baffles; inside this, a heating element; in the center is the charge. Combination of 0.1-micron vacuum and 3000 F controlled temperature makes the furnace ideally suited for heat treating all metals (Jul 28, p102).





HEAT-TREATING FURNACES — *Ipsen Industries, Inc, 721 S Main St, Rockford, Ill.* Model B straight-through heat treating units have been redesigned. New features include quiet gas burners which operate without tail flames; 100% air-gas pre-mix system; super-alloyed ceramic heating tubes; one-piece cast fan and shaft assemblies; improved door sealing; and a redesigned refractory arch for increased strength (Apr 7, p132).



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HARDENING FURNACE — *Lindberg Engineering Co, Heat Treating Div, 2450 W Hubbard St, Chicago 12, Ill.* Landing gear components for aircraft and missiles are hardened in this gantry-type controlled-atmosphere hardening furnace. The furnace unit is raised on a frame structure that moves on rails to span over either a preloading station or adjacent oil and salt quench tanks. Capacity is 10,000 lb (Jul 28, p112).

QUENCHING PRESS — *Gleason Works, 1000 University Ave, Rochester, NY.* No. 117 quenching press utilizes new methods for handling and quenching heated gears and other round, flat and cylindrical parts so that they may be quenched without distortion at a rate three times faster than previously possible. Machine can handle ring gears and cylindrical parts up to 8½ in. max dia and 8 in. max height (Jun 16, p126).

ATMOSPHERE FURNACE — *Lindberg Engineering Co, Pilot Plant Equipment Div, 2321 W Hubbard St, Chicago 12, Ill.* Type GT-34 high temperature furnace has a metal-ceramic tube assembly, complete with blast gates and automatic flame curtains at both ends. The 4-in.-ID tube handles a wide variety of heat treating applications requiring protective atmosphere at temperatures up to 2750 F (Mar 24, p152).

INDUCTION HEATING UNIT — *Scientific Electric, Inc, 111 Monroe St, Garfield, NJ.* This 12½-kw high-frequency unit reduces hardening or annealing time for continuously-fed bandsaw blades from several minutes to seconds. Special r-f work coils concentrate heat in desired area. Variety of sizes available for wide range of applications (Dec 29, p80).

INDUCTION HEATING MACHINE — *Cincinnati Milling Machine Co, Process Machinery Div, Cincinnati 9, Ohio.* Inductron, designed primarily for selective hardening of parts on a production basis, is also suited to annealing, tempering, brazing, soldering, stress relieving and shrink fitting. Designed for either manual or automatic operation, machine uses frequencies up to approximately 100 kc, to provide faster heating, thinner case, and greater freedom from scale and distortion (Apr 21, p189).

HEAT-TREATING LINE — *Surface Combustion Corp, 2375 Dorr St, Toledo 7, Ohio.* Completely automatic line is 95 ft long. It is designed for relatively short runs in forging shops and can process 3000 net lb of work per hr, including forgings that weigh from 2.5 to 75 lb apiece. Automatic tray-return conveyor makes it possible for one man to operate and supervise the entire line (Jan 13, p154).

INDUCTION HEATING GENERATOR—*Lepel High Frequency Laboratories, Inc, Woodside, NY.* Unit is rated at 10-kw output. Lower frequency range is 250 to 600 kc; higher range is approx 2 to 5 mc. Megacycle tank circuit components are located in lower portion of cabinet and standard frequency tank circuit components in smaller cabinet on top. Both circuits use same oscillator tube and dc power supply (Jul 28, p106).

INFRARED MODULES — *Infrared Systems, PO Box 1, Pompton Lakes, NJ.* Line of 1500-F infrared heating modules, with housings that can be quickly stacked into any layout to meet variable requirements, uses elements of formed resistance wire instead of bulbs or tubes. Size of the module is 2 ft x 1 ft x 6 in. Heating modules have three power outputs: 3, 2, and 1 kw (Jul 28, p103).

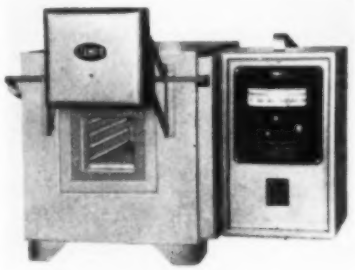
FURNACE—*Pereny Equipment Co, 893 Chambers Rd, Columbus 12, Ohio.* 5000 F electric furnace, Pereco Model CT, has been introduced in a vertical design. Loading of work is accomplished hydraulically and at a rate that can be infinitely controlled through the travel range, making it compatible with the type of specimen being tested. Over-all size is 35 in. wide, 45 in. deep, 86 in. high (Jul 14, p132).

ELEVATOR HEARTH FURNACE — *Selas Corp of America, Dresher, Penna.* Furnace anneals a spun stainless steel cone prior to deep drawing into metal TV picture tube body. Heat-treating temperature is 1600 F (Oct 20, p192).

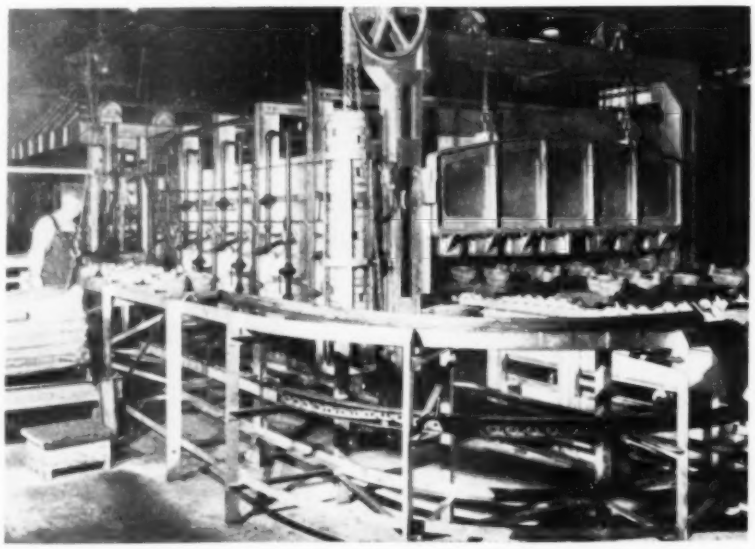
ELECTRIC RESISTANCE MATERIAL—*The Kanthal Corp, Stamford, Conn.* Kanthal-Super is an electric resistance material consisting mainly of molybdenum-disilicide. Basically a cermet, the material is produced by a powder metallurgical process in the form of rods of circular cross-section which, when heated, can be formed into suitable heating elements for furnaces. Max temperature is 1700 C (Oct 20, p198).

STRESS RELIEF OVEN — *Grieve-Hendry Co, Inc, 1401 W Carroll Ave, Chicago 7, Ill.* Two-chamber oven is used for relief of hydrogen embrittlement in plated parts and stress relieving and normalizing of tool, springs, etc. Electric heating is employed (gas available). Upper chamber has 15-kw input heat capacity, max temperature of 1000 F. Lower chamber has 6-kw heat input capacity, max temperature of 650 F. Work space of both chambers is 24 x 24 x 18 in. high (Feb 24, p151).

NITROGEN GENERATOR—*Lindberg Engineering Co, Gas Process Div, 2450 W Hubbard St, Chicago 12, Ill.* Unit produces nitrogen atmosphere by combusting a mixture of air and natural gas, or any manufactured gas such as butane, propane, water gas, or coke oven gas. Atmosphere produced can be used for any application where a high-nitrogen, CO_2 free, dry atmosphere is required (Nov 17, p246).



ELECTRIC FURNACES — *Thermo Electric Mfg Co, 461 Huff St, Dubuque, Iowa.* Type 1900 furnaces have the same general construction but differ in power requirements (115 or 230 volts) and maximum operating temperatures (2000 or 2300 F). Over-all size is 15½ in. wide, 18 in. high and 24 in. deep. The 2000-F models, either 115-v or 230-v, are priced at $195; the higher temperature models at $215. These prices do not include controls (Aug 25, p103).

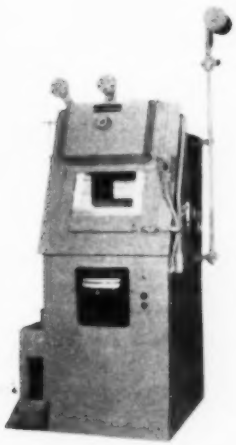


INDUCTION MELTING FURNACES —*Westinghouse Electric Corp, Industrial Electronics Dept, PO Box 416, Baltimore 3, Md.* Furnaces are available in both push-out and tilting types. For nonferrous alloys, the push-out furnace offers advantages in transfer time and interchangeability of crucibles. The tilting-type furnace is recommended for steel and ferrous alloys (Sep 22, p142).

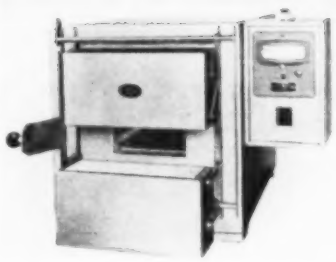
MELTING-HOLDING FURNACES — *Sunbeam Corp, Industrial Furnace Div, 4431 W Ogden Ave, Chicago 23, Ill.* Combination melting-holding furnaces are gas-fired and automatic temperature controlled. Available in capacities from 1200 to 5000 lb, they may be used for die casting, permanent mold casting or sand casting of aluminum. Melt loss is reduced by a deep bath and radiant roof heating (Jun 16, p130).

VACUUM ARC FURNACE—*Distributed by Consolidated Electrodynamics Corp, Rochester Div, 1775 Mt Read Blvd, Rochester, NY.* Designed to provide faster and more economical pilot plant or small-scale production of pure melts of metals and alloys with high melting temperatures, the Model VA-L200H Heraeus furnace is rated at 3000 amps max. It handles melts from buttons to ingots, up to 40 lb of titanium or 70 lb of steel (Jun 16, p128).

HIGH-TEMPERATURE FURNACE — *K H Huppert Co, 6840 Cottage Grove Ave, Chicago 37, Ill.* Electrically-heated KR-Super is designed for operation up to 3100 F without need for protective furnace atmosphere. Elements are protected with oxide coating. Automatic time-temperature run-up and automatic temperature control provide accurate processing. Varety of sizes and styles available (Dec 29, p77).



ATMOSPHERE BOX FURNACE — *Lindberg Engineering Co, Pilot Plant Equipment Div, 2444 W Hubbard St, Chicago 12, Ill.* Type RB-45 atmosphere box furnace is designed for continuous operation at all heat levels up to 2000 F. The chamber is 8 in. wide, 13 in. deep and 5 in. high. All electrical controls and components are mounted in the furnace base (Oct 20, p205).



ELECTRIC FURNACES — *Thermo Electric Mfg Co, 461 Huff St, Dubuque, Iowa.* Four electric bench-type furnaces, designated Type 1800, all have the same chamber dimensions, case size and general construction but differ in power requirements (single or three-phase) and top temperature limits (2000 or 2300 F). Furnaces measure 24 in. wide, 27⅛ in. high and 37¾ in. long. Chamber is 10 in. wide, 9½ in. high and 22 in. deep (Feb 24, p170).

ELECTRIC RECIRCULATING OVEN — *Pereny Equipment Co, 893 Chambers Rd, Columbus 12, Ohio.* Model DRF-555 Pereco unit is designed to operate at temperatures up to 300 F and is heated by fin-strip elements. The 1500-cfm circulating fan is operated by a 1-hp 3-phase motor. Chamber is 38 in. wide, 36 in. deep, 48 in. high; over-all cabinet size is 65 in. wide, 42 in. deep, 66 in. high (Sep 8, p154).

VACUUM FURNACE—*General Electric Co, Schenectady 5, NY.* High vacuums, temperatures to 2700 F, and fast response in heat-treat and brazing cycles can be achieved in this electric bell-type furnace that uses cylindrical metal shields instead of brick to insulate the inside walls. Furnace is used principally for heat-treating superalloys of stainless steel and refractory metals such as titanium and zirconium (Dec 15, p133).

ENDOTHERMIC GENERATOR—*C I Hayes, Inc, 810 Wellington Ave, Cranston, RI.* Design features that allow more accurate control of gas-to-air ratio, retort chamber temperature, carbon pressure, and low dewpoint have been incorporated into Type IGL generators. These units deliver precisely controlled medium or high carbon-potential protective atmospheres (Dec 1, p149).

LIQUID NITROGEN GENERATOR— *Philips Electronics, Inc, Instruments Div, 750 S Fulton Ave, Mt Vernon, NY.* Designed to produce more than four liters of 99.5% pure liquid nitrogen per hour for continuous periods of up to 200 hr, this generator takes up a floor space of only 20x72 in. and is only 78 in. high. Because liquid nitrogen is produced only when needed, evaporation losses are minimized (Oct 20, p198).

COLD UNIT — *Cincinnati Sub-Zero Products, 3932 Reading Rd, Cincinnati 29, Ohio.* Model SA-180-3 has an operating temperature range of –70 to –180 F. Chamber is 26 in. long x 14 in. wide x 13 in. deep. The machine has a dual cascade refrigeration system, and is a portable, plug-in type of machine, with a totally enclosed capillary system (Apr 21, p253).

LABORATORY FURNACES — *Lindberg Engineering Co, Laboratory Equipment Div, 2444 W Hubbard St, Chicago 12, Ill.* Model NEB-4 box furnace is designed for fusions, ignitions, assaying, drying precipitates, and heat-treating small parts. Max operating temperature of 1850 F is reached within 70 minutes. Tube furnace is designed for carbon and sulfur analysis on ferrous, nonferrous, and petroleum samples (Nov 17, p246).

CHILLING MACHINE — *Harris Refrigeration Co, 308 River St, Cambridge, Mass.* Model 5L-2, a 5-cu-ft low-temp chilling and refrigeration unit requires 44 x 30 in. of floor space; chilling chamber has free working area of 30 x 18 x 16 in. deep. Adjustable to maintain temperatures from —70 to —130 F, it is designed for production chilling or environmental testing (Mar 10, p182).

MINIATURE TEST CHAMBER — *Mantec, Inc, El Segundo, Calif.* Model D-106, can maintain –65 F for more than twelve hours on one charging of dry ice. Unit measures 28 in. long, 16 in. high, 15 in. deep and has a 10 x 10-in. test compartment. It is available with top or side loading, and can be furnished for use with either dry ice or liquid CO_2. Heating is electric. Temperature range is –100 F to +400 F (Dec 15, p140).

COLD CHAMBER—*Philips Electronics Inc, Instruments Div, 750 S Fulton Ave, Mt Vernon, NY.* Cold chamber provides 13 cu ft of testing volume and automatically maintains internal temperature at any level in the range from –20 F to –260 F. Refrigeration is produced by the Norelco gas liquefier; cold transfer from machine header to test chamber is accomplished by a circulating air stream (Oct 20, p196).

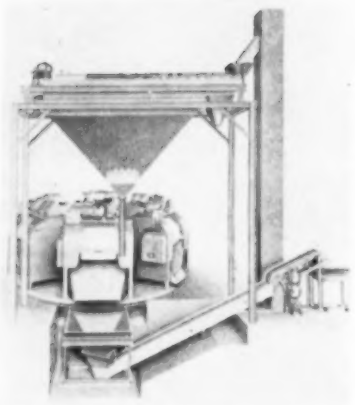
PORTABLE TESTING CHAMBER— *Delta Design Engineers, Inc, 3039 Adams Ave, San Diego 16, Calif.* Model 6545W weighs 40 lbs, automatically cools to –100 F in 5-6 minutes, heats to 500 F in 30 minutes, and keeps desired test temperature within ± 2 degrees over the entire range by use of an anticipator thermostat. Chamber operates on any 115-v 60-c outlet. Test capacity is increased to a 16 x 7 x 7-in. drawer (Dec 1, p154).

COLD CHAMBER — *Cincinnati Sub-Zero Products, 3932 Reading Rr, Cincinnati 29, Ohio.* Model SA-180-3 chamber has an operating range to –180 F. Machine has a dual cascade refrigeration system, and is of the portable, plug-in type. Model AL-120-2 has a standard operating range of –70 to –135 F, but this unit can be provided for either higher or lower temperature ranges. Chamber is 24 in. long, 12 in. wide and 12 in. deep (Oct 20, p200).

STRESS RELIEVING PROCESS — *Aluminum Company of America, Pittsburgh 19, Penna.* Thermo-mechanical procedure reduces the internal stresses caused by quenching aluminum (after heat treatment) by superimposing a system of thermal gradients opposite to those which created the stresses during quenching. Chief value will be in providing complex, fully heat-treated aluminum shapes with a low level of internal stress (Dec 1, p142).

American Machinist 1959 PRODUCTION PREVIEW

CLEANING AND FINISHING



BARREL FINISHING SYSTEM — *Almco, Queen Products, Inc, Albert Lea, Minn.* Six-Station automatic system, mounted on a turntable and equipped with a "memory" device, rotates completed work to a single operator station for unloading and reloading. As operator loads each barrel, he sets its timer for a predetermined processing cycle. Continuous processing times of 15 min to 50 hr are available (Mar 19, p172).

FINISHING PROCESS — *Roto-Finish Co, Kalamazoo, Mich.* Cor-A-Brite metal finishing process utilizes one chip mass in one standard barrel finishing machine to produce bright, lustrous finish on high-alloy steels. Quality of results is directly related to quality of the steel. Process gives a better surface on hardened steels than on unhardened steels of same alloy (Jul 28, p112).

BARREL FINISHING UNIT—*Rampe Mfg Co, 14915 Woodworth Ave, Cleveland 10, Ohio.* Model DLX for tumbling, deburring, and polishing is a 2.2-cu-ft machine with two or three compartments and 12- to 36-rpm variable speed drive. Enclosed cabinet provides a built-in reciprocating screen separator and a 1-cu-ft hopper pan for fast handling of work and media (May 19, p178).

TUMBLE-BARREL FINISHERS — *Rampe Mfg Co, 14915 Woodworth Ave, Cleveland 10, Ohio.* Many different finishing operations and a wide range of products can be handled with the Model V4 and V6 barrel finishing machines. Machines have 4- and 6-cu-ft barrels with two or three interchangeable compartments, respectively. Both models have 23-rpm fixed speed drive, or an optional 12- to 36-rpm variable speed drive (Jun 16, p130).

BARREL FINISHING MACHINE — *Techline Div of Wheelabrator Corp, 1140 Ave V, Vicksburg, Mich.* Techline Model 30 machines are available in 20 models ranging from 5 to 30-cu-ft capacity with one to six separate compartments, designed for both wet and dry processes. Standard cylinders are lined with $\frac{1}{4}$-in. neoprene. Other linings include $\frac{1}{4}$-in. rubber, and $\frac{1}{2}$, $\frac{3}{8}$, or $\frac{1}{4}$-in. rubber or neoprene, and $\frac{1}{4}$-in. steel plate (Oct 20, p195).

PARTS-MEDIA SEPARATOR — *Esbec Barrel Finishing Corp, 18 Beech St, Byram, Conn.* Vibra-Grader is dual-function separating machine which not only separates processed parts from the media but grades media as well. Its screening arrangement makes three simultaneous arrangements. An unusual vibratory mechanism sets this unit aside from conventional shaker-screen units. Price is in the $1000 range (Apr 21, p192).

BARREL FINISHING MACHINE — *Almco, Queen Products, Inc, Albert Lea, Minn.* Model DBO-2A barrel finishing machine is designed to deburr and finish small or medium lots of parts. It features a twin-compartment, 5.6-cu-ft neoprene-lined barrel with a built-in separating system for each compartment. Barrel speeds range from 8 to 38 rpm. Max work load is 700 lb (Apr 21, p195).

BARREL FINISHING SYSTEM — *Metal Finish, Inc, 410 Frelinghuysen Ave, Newark, NJ.* Vibraslide barrel finishing machine combines the principles of rotation and vibration to produce extremely rapid results. Reported to be the first unit capable of finishing inside diameters, the machine is also capable of cutting time cycles by as much as 70%. The barrel rotates at speeds from four to 20 rpm; vibration is fixed at 2300 cpm. Rotary and vibratory systems may be used separately (Feb 10, p152).

BARREL FINISHING MACHINES — *Crandall Engineering & Mfg, Inc, Vicksburg, Mich.* No. 30 Series consists of fifteen models with capacities from 5 to 25 cu ft. Use of oversize varispeed V-belt system instead of conventional chain drives is said to minimize shock and vibration. Motor is standard NEMA re-rated 1800 rpm on fixed amount at rear (Mar 10, p170).

BARREL FINISHING MACHINE — *Almco, Queen Products, Inc, Albert Lea, Minn.* Supersheen Model EB-3032 has a 30-in.-dia x 32-in.-long barrel for finishing small parts as well as large castings and forgings. Total barrel capacity of 13.8 cu ft or 1000 lb can be divided into two compartments if desired. Barrel drive is through a $1\frac{1}{2}$-hp motor and allows speeds of 10 to 30 rpm (Aug 25, p106).

BARREL FINISHING MACHINES — *Esbec Barrel Finishing Corp, 18 Beech St, Byram, Conn.* Series HD has been redesigned to provide fast-acting, lightweight safety doors; fingertip operation of drum safety guard; and greater load carrying capacities. Other features include reduced floor space requirements; load rated drives; standardized replacement parts; and electrical controls (Apr 21, p184).

PORTABLE BENCH TUMBLER — *Rampe Mfg Co, 14915 Woodworth Ave, Cleveland 10, Ohio.* Mini-Tumbler has a 24-52-rpm variable speed drive for added flexibility. The 1-gal-capacity unit is available with either open conical or closed hexagonal burring barrel, protected with plastic lining. Power is furnished by a 1/12-hp 110-v motor. Model is 10 in. long x 2 in. wide x 10 in. high. Price is about $135 (Oct 6, p130).

BARREL FINISHER—*Rampe Mfg Co, 14915 Woodworth Ave, Cleveland 10, Ohio.* Model V8 8-cu-ft machine uses vinyl-lined barrels that are divided into one, two or four compartments. Rotation speed is 12 to 36 rpm. The multi-compartment barrels permit simultaneous processing of different workpieces in same machine. Machine requires less than 22 sq ft of floor space (Nov 3, p138).

TUMBLING CREAMS—*H W Kramer Co, Inc, 120-30 Jamaica Ave, Richmond Hill 18, NY.* Dry tumbling creams, for use with wood pegs, sawdust or cobdust, are reported to provide clearer, brighter, and more scratch-free surfaces on metal and plastic products. The Microlyte finishing cream is used first; then the Hi-Gloss cream is used to obtain a clear, high luster (Nov 17, p255).

CLEANING MACHINE — *Pangborn Corp, Hagerstown, Md.* 20-cu-ft-capacity Rotoblast barrel, Type 20 GN, is designed for increased cleaning speed, greater flexibility, and reduced abrasive loss. The 30-hp motor throws 50,000 lb of abrasive per hr. A heavy-duty work conveyor handles loads up to 3500 lb. Unit is 8 ft 5 in. deep, 11 ft 10 in. wide and 16 ft 11⅜ in. high (Nov 3, p130).

ABRASIVE BELT GRINDER—*Grinding & Polishing Machinery Corp, 2530 Winthrop Ave, Indianapolis 5, Ind.* Model TS-90 is designed so that it can be used to finish inside surfaces where clearance is a major factor. Tool uses a 1- or 2-in.-wide 90-in.-long belt, and is suitable for use on metal, wood, or plastics for the removal of flash or parting lines on nonferrous castings, molded rubber and plastic parts, or sharpening special die shapes (Oct 6, p132).

ABRASIVE BELT WHEEL — *Miller Products Co, 1438 12th St, Box 325, North Chicago, Ill.* This expanding wheel for circular abrasive belts is self-balancing and maintains a flat edge so that it can be used for such work as polishing and tool grinding as well as rough deburring. Two styles are available. No. 7125-1725 can be used at speeds from 1250 to 2250 rpm; No. 7125-3450, at a speed of 3450 rpm (Oct 20, p225).

PERCUSSION CLEANING TOOL — *L C Nasham Co, 215 S Third St, Allentown, Penna.* Airnesco Pulsair Gun is a percussion cleaning tool designed for wide range of cleaning operations such as cleaning machinery, motors, and castings. It can employ air alone, air and steam, or air and chemicals. The pulsating air blasts hit the surface at about 20 times the original air pressure (Apr 21, p207).

ROTOBLAST BARREL — *Pangborn Corp, Hagerstown, Md.* 72-cu-ft unit is designed to blast-clean loads of castings, forgings, and heat-treated parts, weighing up to 6 tons, in five minutes. The 72 Type GN barrel is equipped with two Rotoblast wheels, each capable of throwing 120,000 lbs of abrasive per hr. All operations, including loading, starting, stopping, and unloading, are automatically controlled (Mar 24, p172).

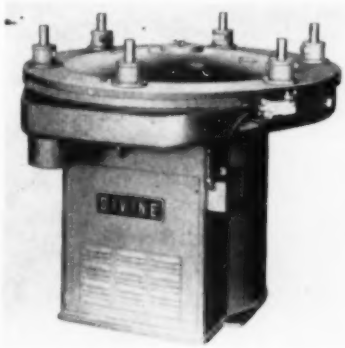
FLEXIBLE ABRASIVE DISKS—*Foster Supplies Co, 6122 Milwaukee Ave, Chicago 46, Ill.* Flexible abrasive disks and locking holders, tradenamed Contur, have operating speeds up to 90,000 rpm, depending upon size. Disk holders are made of aluminum and are reported to have long service life. Disks are available in sizes from ¾ to 4 in. and grits from 24 to 320 (Dec 29, p 78).

POLISHING CONVEYOR — *Divine Brothers Co, Utica, NY.* Model RV-X, for use in polishing, buffing, or brushing head units, consists of a 72-in.-dia table containing eight fixture spindles on a 66-in.-dia centerline. Height from floor to top of fixture spindle is 42 in. max. Dial index rate is 120 to 1000 per hr; fixture spindle speed, 12 to 100 rpm; fixture spindles are 1½-in. dia x 3 in. (Dec 15, p138).

BELT SANDER — *Black & Decker Mfg Co, Towson 4, Md.* New 3-in. model attaches to any standard industrial vacuum cleaner to eliminate 90% of all dust and fine metal powder; sanding can be accomplished in the same area where painting is being done. Timing-belt drive provides smooth, quiet operation and requires no lubrication (Oct 20, p193).

LIQUID BLASTING MACHINE—*Hydro-Hone Corp, 7516 Pacific Blvd, Huntington Park, Calif.* Model 15 Hydro-Hone, for cleaning, finishing, peening, burnishing and deburring of metal parts in volume quantities, produces micro finishes in the range 16 to 250. Unit operates on 20 to 65 cfm of air at 90 psi. Internal working area is 20 x 20 x 20 in. Blower removes vapor and fog (Dec 29, p80).

ABRASIVE BELT MACHINE—*Carborundum Co, Curtis Machine Div, Jamestown, NY.* Versa-Mite bench-mounted machine has a fast-cutting abrasive belt and a serrated contact wheel. A coated abrasive disk, fastened to the side of the contact wheel, and a tilting adjustment on the table permit square and angle grinding as well as chamfering and surfacing (Jun 2, p119).

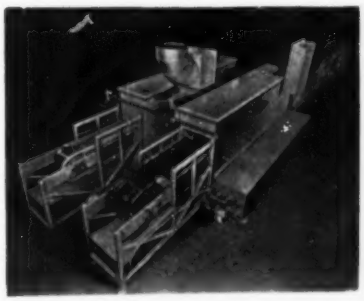


INDEXING POLISHING CONVEYOR —*Divine Brothers Co, Seward Ave, Utica, NY.* Model RJ indexing conveyor is designed for use with polishing, buffing, and brushing head units on automatic installations. Workholding dial is provided with six fixture spindles. Dial index rate is adjustable from 120 to 1800 indexes per hr with fixture spindle speed adjustable from 12 to 100 rpm (Nov 3, p131).

POWER DEBURRERS—*Sigwell Corp, 224 Glenwood Ave, Bloomfield, NJ.* The Burrwel, available in three models, will deburr and chamfer all kinds of material including metal, plastic, hard rubber and nylon, as well as surfaces considered difficult to file. Floor Model 200 has unlimited capacity on all external straight or round edges. Range is from zero to ¼-in. cut in hard steel (Oct 20, p229).

VIBRATORY FINISHING MACHINE —*Syntron Co, 311 Lexington Ave, Homer City, Penna.* LP-4 lapping machine uses controlled vibration for fast processing of metal parts weighing in excess of 75 lbs. This vibration produces a combined rotary and forward movement of the parts over an abrasive cloth in the pan. Model can handle single parts as large as a 35-in.-dia shaft seal component or groups of smaller parts (Nov 3, p138).

LAPPING KIT—*Starn Tool & Mfg Co, State Road Hill, Meadville, Penna.* Lapping kit has six perfectly flat, semi-steel lapping plates; six compartments for holding compound and miscellaneous items; is housed in a mahogany box. Recesses on the plates are provided for color coding, to match the color of compounds used. Price is $75 (Aug 11, p120).



WASHER-DRYER—*Michigan Tool Co, Gear-O-Mation Div, 7171 E McNichols Rd, Detroit 12, Mich.* High-speed system for automatic "hot" washing and air drying of all types of parts uses integrated parts handling through two stages of hot washing and a blow-off (or drying) stage. Cycle time at 100% capacity is 15 sec. Although the equipment is custom-tailored to specific applications, it is assembled from standard components (May 5, p154).

DEBURRING MACHINE—*Model Machine Co, 4729 Hawthorne St, Philadelphia 24, Penna.* Bench-type machine uses opposed spindles to deburr both sides of holes from 1/32 to ½ in. diameter. Spindles rotate in opposite directions, eliminating cutter torque, making hand feeding safe and easy. Machine is foot controlled and spindle is air operated, leaving both hands free to feed machine (Jul 14, p120).

CLEANING MACHINE — *Magnus Chemical Co, Inc, Equipment Div, Garwood, NJ.* Small metal parts, loaded in baskets, are washed and rinsed by vertical agitation in the two-stage Aja-Lif automatic section of this equipment at the rate of 25 baskets per hr. Machine cleans the tote boxes simultaneously (Feb 10, p176).

CLEANING and FINISHING

PARTS WASHING MACHINE—*Ransohoff, Inc, North Fifth St and Ford Blvd, Hamilton, Ohio.* Operation is completely automatic in this vertical unit. During upward travel the work is subjected to thorough spray action cleaning. Work is discharged into an unloading chute that can be used to carry it on to the next manufacturing stage. Production rate is 2000 pieces per hr (Jun 16, p134).

VAPOR STEAM CLEANER — *Circo Equipment Co, Clark, NJ.* Model 120, for one-man operation, is fully automatic. From the point at which the dry cleaning compound is placed in the tank until it emerges as a super-saturated jet of steam from the gun, the entire mixing operation is automatic. Unit is available in stationary or portable models of 120-gal capacity (Feb 24, p156).

STEAM CLEANER — *Pantex Manufacturing Corp, PO Box 660, Dept SG, Pawtucket, RI.* Hydro Steam-Jet Cleaner makes scalding hot water, and/or saturated steam continuously available at pressures up to 185 psi. Separate lightweight lances are provided for directing jets at high velocity. Detergents or solvents are automatically added to hot water or steam jet under fingertip control of the operator (Mar 10, p164).

STEAM CLEANER — *Clayton Mfg Co, 401 N Temple City Blvd, El Monte, Calif.* Model 280 Blast-Master, self-contained and fully automatic, is equally effective for light, medium, heavy, or extra heavy cleaning. Fleximatic control permits operator to select and use all or any part of the 280-gph capacity from one or two guns used singly or simultaneously (Feb 10, p172).

CLEANING UNIT — *Argosy Industries, Inc, 67 May Court, Chagrin Falls, Ohio.* The J P Whirlpool industrial cleaner removes grease and sludge while cleaning out metal cuttings, borings and drillings in one mechanical operation. Recommended for cleaning of production-line castings, gears, bearings, engine blocks, units are available in ten standard models ranging from 75 to 2000-gal capacities (Feb 10, p170).

ELECTROSTATIC SPRAY SYSTEM —*Ionic Electrostatic Corp, Garfield, NJ.* Model M-50 centrifugal-type multicolor electrostatic spray system is adaptable to producing both single color and multi-color patterns or finishes. The system utilizes several variable-speed electrostatically charged centrifugal atomizers which blend coating materials to produce the patterns. Reciprocating and stationary models are available (Oct 20, p196).

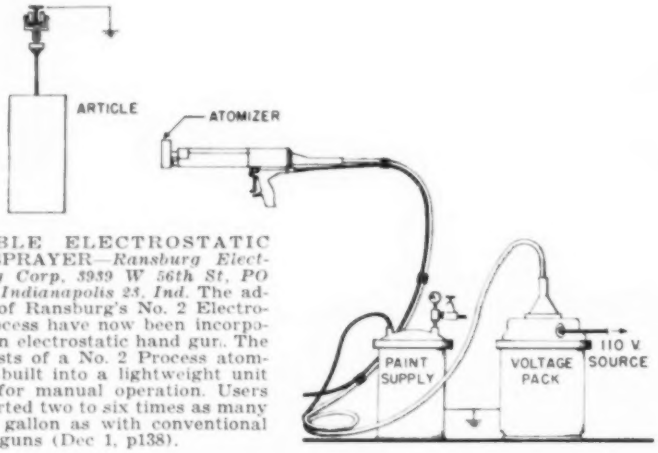
CONVERSION COATING MACHINE —*Hanson-Van Winkle-Munning Co, Church St, Matawan, NJ.* This fully automated, straight-line conversion coating machine is recommended for blackening, phosphating, bright dipping, pre-cleaning and pickling. Convert-O-Matic, as the machine is called, provides maximum cycling flexibility by settings of selective timers for each treatment tank (Sep 22, p152).

VACUUM COATER — *Consolidated Electrodynamics Corp, Rochester Div, 1775 Mt Read Blvd, Rochester 3, NY.* Designed to vacuum-metallize workpieces up to 22 x 50 in., this 72-in. vacuum coater, Model LC1-72, has a planetary drive fixture with six rotating stations. The complete vacuum cycle is semi-automatically controlled by a four-position indexing switch on control panel (Nov 3, p136).

SPRAY COATING PUMP — *Nordson Corp, Amherst, Ohio.* Model AP for use in Nordson airless and hydraulic spray coating systems is designed to operate at pressures up to 1500 psi and at temperatures up to 500 F. Unit can be used for applying all types of coating materials including plastisols and hot resinous materials. It can deliver material at rate of 1½ gpm (Aug 11, p124).

PAINT SPRAYING UNIT—*The Gray Co, Graco Sq, Mnneapolis 13, Minn.* Graco Hydra-Spray performs paint spraying without using heat or atomizing air. Unit is air-operated, eliminating spark hazard and making it economical to operate (Oct 20, p200).

SPRAY PAINTING UNIT—*Binks Mfg Co, Chicago, Ill.* This modular electrostatic spray painting unit with grid and case is one of company's new items. Other equipment includes rotary spray painting equipment with electric timers and conveyors, a new paint heater, and Kayo and Pogo series paint pumps delivering paint at 2:1 to 4:1 ratio (Oct 20, p200).



PORTABLE ELECTROSTATIC PAINT SPRAYER—*Ransburg Electro-Coating Corp, 5939 W 56th St, PO Box 7822, Indianapolis 23, Ind.* The advantages of Ransburg's No. 2 Electro-Spray Process have now been incorporated in an electrostatic hand gun. The gun consists of a No. 2 Process atomizing bell built into a lightweight unit designed for manual operation. Users have reported two to six times as many parts per gallon as with conventional air spray guns (Dec 1, p138).

ULTRASONIC CLEANER — *Lawrence Manufacturing Corp, Evans Terminal, North Broad St, Hillside, NJ.* Ultracleaner Model 500A, a 53-lb stainless steel unit, accommodates parts up to 10 in. in length. One or two chambers may be used separately or simultaneously (Apr 7, p138).

ULTRASONIC GENERATOR—*Branson Ultrasonic Corp, 40 Brown House Rd, Stamford, Conn.* Model APT-500 Sonogen generator with 3-kw average power output is designed for high-volume production cleaning and will activate up to 6 sq ft of transducer area, or 300 gallons of cleaning solution. Remote control panel connects to the unit through a multi-conductor cable (Dec 1, p156).

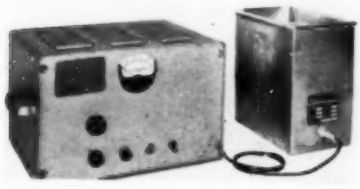
ULTRASONIC CLEANERS — *Gulton Industries, Inc, Vibro-Ceramics Div, 212 Durham Ave, Metuchen, NJ.* This new line of industrial ultrasonic cleaners includes six models of bench, floor and self-contained styles, all featuring forced air cooling. The units are designed for the full range of industrial cleaning and degreasing requirements, with tank capacities ranging from two to 20 gallons (Aug 25, p106).

ULTRASONIC CLEANER—*Alcar Instruments, Inc, 17 Industrial Ave, Little Ferry, NJ.* New 50-w unit is designed for small part cleaning, blind hole washing, removal of radioactive contamination, printed circuit cleaning, and similar operations. Electronic generator delivers power to crystal transducers mounted on the bottom of the stainless steel tank. Tank measures 6 x 6 x 6 in., has 2-qt liquid capacity (May 5, p164).

ULTRASONIC CLEANER—*Narda Ultrasonics Corp, 625 Main St, Westbury, LI, NY.* Series 5000 SonBlaster, designed for large-volume cleaning operations, features a 500-watt generator and a 10-gallon tank. The generator is equipped with tank selector and load selector switches so that it can operate either one or two tanks alternately, or submersible transducers in tanks up to 30-gallon capacity. Unit is priced at $1325 (Oct 20, p194).

ULTRASONIC CLEANER — *Hermes Sonic, 13-19 University Place, New York 3, NY.* One-gallon-capacity portable ultrasonic cleaning unit cleans intricate assembled parts and other hard-to-clean objects. In addition, the unit is reported to be highly effective for degreasing, decontamination, removal of excess flux, mixing and emulsifying. Generator has an output of 50 watts (avg) with a peak of 200 watts (Feb 10, p158).

ULTRASONIC PROCESSING TANK —*General Ultrasonics Co, 67 Mulberry St, Hartford 3, Conn.* Stainless steel treatment chamber is 14 in. long, 9 in. wide, 10 in. deep. It is fitted with two welded stainless steel drain connections for recirculation of process liquids, and is powered by a GU-420 generator with output of 400 watts continuous at 20 kc/sec. Power connections to the tank are by a heavy-duty waterproof connector (Sep 22, p148).



ULTRASONIC CLEANER—*Alcar Instruments, Inc, 17 Industrial Ave, Little Ferry, NJ.* Low-frequency model is available for small parts cleaning, blind hole washing, removal of radioactive contamination, printed circuit cleaning, and similar operations. Standard unit consists of an electronic generator delivering 60 w average, 240 w peak, of energy to crystal transducers mounted on a 1-gal stainless steel tank (Dec 15, p135).

ULTRASONIC CLEANER — *Blackstone Corp, Jamestown, NY.* Model GW-6 has two 10x14x10-in.-deep stainless steel tanks for ultrasonic cleaning and rinsing. The solution in each tank is continuously circulated and filtered to remove all particles of 2-5-micron sizes or larger. Transducers operate at 20 kc per sec. Basic unit is available with either single or multiple tanks which fit into the 25x25-in. cabinet top (Sep 8, p144).

ULTRASONIC CLEANER — *Alcar Instruments, Inc, 17 Industrial Ave, Little Ferry, NJ.* This 2-kw ultrasonic cleaner is designed for small part cleaning, blind hole washing, removal of radioactive contamination, printed circuit cleaning and other difficult operations. The 9 x 14 x 13-in.-deep tank holds 5 gal. Timer is provided to shut off the generator at a predetermined time (Mar 10, p172).

CHROME PLATING UNIT—*Dawson Corp, 302 Fifth Ave, Pelham, NY.* Model A No. 75 Chromplater is a package unit designed for plant maintenance. Among its many uses are: prolonging cutting tool life, salvaging worn parts, plating friction parts, and protecting against corrosion. Unit deposits from 0.0001 to 0.010 in. of chrome on taps, dies, drills, reamers, form tools, shafts, gears, and on all types of worn parts (Jul 28, p106).

PLATING RECTIFIER — *Wagner Brothers Inc, Equipment Division, 7800 Dix Rd, Detroit, Michigan.* Silicon plating rectifier with ability to operate in ambient temperatures of over 200 F, and high voltage rating, can be adapted for a variety of controls, depending upon application setup. It includes a class B transformer and is equipped with a coil for each cell (Jun 16, p158).

PLATING ACCESSORY—*Marlane Development Co, 153 East 26 St, New York 10, NY.* Variable speed turning head simplifies Dalic plating of circular or cylindrical pieces. Dalic plating is a method for depositing any metal on any other base metal, on only those areas where the deposit is actually needed. Speed range is from zero to 400 rpm. Entire unit, consisting of motor, variable speed control, overload protection, two pillow blocks, and a 3-jaw chuck, costs $425 (Aug 11, p146).

PLATING CONTROLLER — *Ramyr Mfg Co, 1779 N Main St, Los Angeles 31, Calif.* Unit is designed for precision plating of precious metals on electronic components. Features include Sangamo ampere-hour meter to measure deposition of metal and to determine amount of metallic content to be replaced; a 0 to 1-amp meter; and an automatic timer. Over-all size is 14¼ in. high by 14½ in. deep by 21½ in. wide (Nov 17, p262).

PROTECTIVE COATING PROCESS—*Wall Colmonoy Corp, 19345 John R St, Detroit 3, Mich.* Nicrocoat process provides sheet metal parts with a furnace-bonded coating which resists oxidation, abrasion and corrosion. Process consists of applying thin coating of a metal alloy to the base metal after fabrication. Three different alloys are available, each having the same high-nickel base but intended for different requirements (Dec 15, p140).

ALUMINUM CLEANER — *Farrelloy Co, 1217 North 26th St, Philadelphia 21, Penna.* Chemical formula called Alumatreet cleans corroded aluminum and at the same time creates an absorptive crystal coat. Double action is said to assure a tight paint lock, free from blisters and peeling. Product protects the treated surface so that if paint is scratched corrosion will not creep underneath (May 19, p187).

TEFLON COATINGS — *Acheson Colloids Co, Port Huron, Mich.* Emralon family of dispersions is composed of tetrafluoroethylene particles suspended in a liquid carrier. Emralon dispersions can be cured at 300 F or even less. Material should be applied with a spray gun. This is followed by air drying, infra-red, or oven curing, depending on the Emralon used. Normal film thickness is about 0.6 mil (Nov 17, p246).

TINNING SOLUTION—*Desert Laboratory, 17-312 N Indian Ave, North Palm Springs, Calif.* Instant Tin applies a workable deposit of tin to brass and copper articles. No current, heat, or equipment are required. The finish is an aid to soldering and acts as protection against atmospheric corrosion. One gallon covers approx 800 sq in. with a thickness of 0.0001 in. Price is $14.95 per gal (Nov 3, p143).

METAL CLEANER—*Magnus Chemical Co, South Ave, Garwood, NJ.* Magnusol X-4 for removal of grease and oil from surfaces is made from a new odorless emulsifier. Product can be sprayed, brushed, or wiped over an oily surface, followed by a pressure water rinse; it can also be used for tank cleaning (Aug 25, p116).

CLEANING ABRASIVE — *Pangborn Corp, PO Box 380, Hagerstown, Md.* Made of electric furnace alloy steel, this new steel blast-cleaning abrasive, known as Rotoblast Steel Shot, is shotted by an exclusive vacuum cast method said to provide greater density, extreme uniformity, toughness, and a narrow hardness range. Available in all standard SAE sizes, the abrasive is shipped in 50-lb bags (Jun 16, p132).

LIQUID BUFFING SPRAY SYSTEM — *Hanson-Van Winkle-Munning Co, Church St, Matawan, NJ.* Liquid buffing compound spray system comprised of an air-operated pump, distribution lines and spray guns, delivers precisely metered quantities of spray at intervals governed by a timer. Abrasive action takes place only where buff is in direct contact with the work; there is no loss of compound from breaking up (Aug 11, p83).

CLEANING AGENT—*Magnus Chemical Co, South Ave, Garwood, NJ.* Magnus 61-DRX, for removal of light films of oil, shop dirt, and rust deposits from ferrous metal parts, is a granular mixture of strong alkalis containing a special corrosion-solubilizing compound and a wetting agent. Product is normally used in hot water (Aug 25, p115).

METAL CLEANER—*Enthone, Inc, 442 Elm St, New Haven, Conn.* Emulsion Cleaner 62 for cold cleaning of all metals removes heavy oil films and solid dirt, is furnished ready-to-use or as a concentrate. Requires only a plain steel tank or drum, without any heating or cooling facilities (Jun 16, p162).

ANODIC COATING — *Dow Chemical Co, Midland, Mich.* Anodic coating for magnesium provides a clear protective coat for magnesium products. New anodize should be used under a lacquer or varnish for maximum corrosion protection. Treatment is a modification of the standard Dow 17 anodic treatment, and is applicable to all forms of magnesium, such as castings, sheet, extrusions, and forgings (Dec 1, p160).

METAL COATING—*J Landau & Co, Inc, Carlstadt, NJ.* Metal coating, tradenamed Dunal, is applied to parts before they are machined. Subsequent machining does not mar or crack the finish. Dunal can be dipped or sprayed on, then baked for a permanent finish (Dec 1, p160).

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INSPECTION AND LAYOUT

DIRECT-READING MICROMETER—*Brown & Sharpe Mfg Co, Providence, RI.* No. 200 micrometer measures from 0 to 1 in. by ten-thousandths. Clear plastic windows show numbers indicating thousandths, in units of five thousandths; ten-thousandths are read from vernier; five ten-thousandths from the thimble. There is no parallax error (Apr 21, p179).

GROOVE MICROMETER — *Consolidated Aircraft Products, El Segundo, Calif.* Multi-Mike carries a standard micrometer head. Two disks form the jaws or measuring surfaces. Measuring capability ranges from 0.050 to 1.050 in., and in measurement of lands or widths between grooves, from zero to 1.000 in. Measurement of grooves can be accomplished in holes as small as 0.550 in. dia (Jun 16, p132).

MICROMETER—*Imported by Opto-Metric Tools, Inc, 137 Varick St, New York 13, NY.* This "window-reading" micrometer (West Germany) does away with the "quarter" divisions of 25, 50 and 75 on the sleeve. Instead, sleeve bears graduations in tenths of an inch. Hundredths are read in window and thousandths are read from thimble, opposite the ten-thousandths vernier. Range is 0 to 1 in. (Oct 20, p218).

DIAL MICROMETER — *B C Ames Co, Waltham, Mass.* Dial micrometer, 1-in. capacity, is designed for rugged, heavy-duty use. Light in weight, it is well balanced for easy handling. It is reported ideal for general shop use, and can be modified for special purposes through specially shaped contacts and anvils (Apr 21, p287).

MICROMETER HEAD — *L S Starrett Co, Athol, Mass.* No. T465 is designed for use in electronic equipment requiring ultra-fine adjustment, and for machine tools, fixtures, special gages and tools where micrometer accuracy in settings and adjustment is needed. Device reads directly in ten-thousandths and has 1-in. range (Apr 21, p192).

GROOVE MICROMETER — *Illinois Metal Products, 429 W Superior St, Chicago 10, Ill.* Designed to measure and check the depths of internal O-ring, retaining ring and recess grooves, the Imp inner-groove micrometer provides two interchangeable anvils—one for narrow retaining ring grooves, and a wider anvil for O-ring grooves. Other anvils can be purchased in widths up to 0.230 in. (Apr 21, p189).

ELECTRONIC MICROMETER—*J W Dice Co, Englewood, NJ.* Latest addition to company's line of digital readout micrometers is this automatic electronic unit that features adjustable measuring pressure. Standard reference measuring pressures can be set to 1.5, 5, 10 or 20 grams; with a special tip a negligible measuring pressure is attained (Aug 11, p122).

DISK-FACE MICROMETER — *Lufkin Rule Co, Saginaw, Mich.* Reported to be ideal for measuring gear teeth, forming tools and dies, the tool measures to a depth of $\frac{1}{8}$ in. on forms having grooves wider than 0.015. Micrometer is available in two sizes—No. 3611 with a range of 0 to 1 in. by thousandths, and No. 3612 with a range of 1 to 2 in. by thousandths (Apr 21, p190).

MICROMETER CALIPER — *L S Starrett Co, Athol, Mass.* Frame of No. 436 Series 1-in. outside micrometer caliper is specially forged and ribbed for extra strength and tapers to the anvil to permit use in narrow slots and tight places. Unit is furnished with or without locknut, is also available (at additional cost) with ratchet stop at end of thimble or with friction control (Feb 24, p164).

WORK POSITION GAGE — *Cleveland Instrument Co, 735 Carnegie Ave, Cleveland, Ohio.* Model XA-515 Ex-Ac provides a fast and accurate means of locating or measuring work position and dimension on any jig borer, jig grinder, and any other machine tools with rotating spindles. Three-scale amplifier provides magnifications up to 10,000 times and covers a range of ±0.005 in. (Apr 21, p186).

PRODUCTION MICROMETER — *Marketed by Affiliated Manufacturers Inc, 60 E 42 St, New York 17, NY.* Motor-driven production micrometer is reported to handle up to 10,000 pieces per hr. Known as the Roller Mike, unit is designed to sort and measure small-to-miniature parts, for precise classification by thickness, in production quantities or small lots, and with total tolerances down to 0.000030 in. Device is self-contained, weighs 32 lb, and is driven by a 110-v, 60-c, single phase, 3, 25 or 75-rpm motor. It has 18 collecting bins (Feb 10, p154).

INTERNAL TAPER MIKE — *Taper Micrometer Corp, 100 Grove St, Worcester, Mass.* Tool eliminates all guesswork in measuring tapered holes. Tool uses a 1-in. sine bar and measures to ±0.0002 in. (Aug 11, p142).

GAGING INSTRUMENTS — *Sheffield Corp, Dayton 1, Ohio.* Electronic hole checker measures bores for size and taper down to 0.043 in. and up to 1$\frac{1}{8}$ in. The Feathertouch gaging head is an electronic pickup unit used with an Accutron amplifier to make precise measurements of small, thin, or highly polished metal and non-metal parts and surfaces. The Centerfind gage speeds hole location or centering on a jig borer or jig grinder (Apr 21, p187).

PLUG GAGES — *Spence Industries, 6910 Chase Rd, Dearborn, Mich.* Called Jo-Plugs, these gages simplify inspection and setup procedures for checking the dimensional accuracy of threaded hole centers. To check center distances, proper size Jo-Plugs are screwed into the holes, allowing the Jo-spindles to act as reference measuring points (Aug 25, p108).

SMALL BORE GAGES—*Foster Supplies Co, 6122 Milwaukee Ave, Chicago 46, Ill.* Set E4 covers diameters from 0.820 to 1.130 in. Gages are accurate to within 0.00008 in. Previous sets covered 0.057 to 0.828 in.; all sets overlap in size (Nov 17, p243).

THREAD COMPARATOR — *Johnson Gage Co, 53½ Cottage Grove Rd, Bloomfield, Conn.* Model JB-N pivotal plug-snap comparator is a bench-type instrument for internal thread checking. Capacity is No. 4 through 1½-in. threads (Apr 21, p249).

PITCH DIAMETER GAGE—*Holmes Gage & Development Corp, 537 Bonham Ave, Columbus 3, Ohio.* Device incorporates mechanical amplifier mounted on gage body to amplify measurements five times. A step on top of the amplifier unit shows instantly whether or not minimum tolerances are exceeded. Steps are ground with tolerance of +0.0000 and −0.0005. Gages are obtainable for practically all sizes of gears (Oct 6, p134).

SCREW THREAD COMPARATOR — *O-Vee Gauge Co, 3626 W Slauson Ave, Los Angeles 43, Calif.* Unit utilizes an application of the wire method to measure the pitch diameter of threads to Class 3 and 3A tolerances (Apr 21, p237).

VERNIER CALIPERS — *Distributed by George Scherr Co, 200 Lafayette St, New York 12, NY.* Stainless steel Lustro-Chrome calipers are designed with raised edges that act as a guide-way for the vernier scale. Toolmaker's caliper is available with 8, 10, and 12-in. measuring capacity. Shop caliper is designed for measuring of outside, inside, and depth dimensions with measuring capacity of 5 5/16 in. (May 19, p185).

WAVINESS GAGE — *Micrometrical Mfg Co, 345 S Main St, Ann Arbor, Mich.* Wavometer measures waviness on symmetrical surfaces of rotation. It will measure on ID's and OD's of surfaces up to 18 in. in diameter. Instrument gives meter reading of the rms average height of the waves in two wave bands, directly in mu-in. Visual and audible signals are also given (Jun 2, p126).

SURFACE GAGE — *Micrometrical Mfg Co, 345 S Main St, Ann Arbor, Mich.* Proficorder is designed to measure and record the true profile of practically any machined or finished surface. It produces a pen-drawn chart of the surface that shows the shape, spacing and micro-inch height in readable form. Length of trace is from 1/16 to 1¼ in. with adjustable stops for any length (Apr 21, p205).

TOOLING BRIDGE EQUIPMENT — *Challenge Machinery Co, Grand Haven, Mich.* Equipment for measuring irregularly shaped objects is available in lightweight line. Typical setup consists of semi-steel base unit and magnesium vertical and horizontal units that can be easily moved in any position. Bulletin 826 (Feb 10, p166).

HEIGHT GAGE — *L S Starrett Co, Athol, Mass.* No. 24 master vernier height gage has long, open-face vernier scale flush-fitted to main scale to eliminate reading errors caused by parallax. The 50 widely spaced divisions on the vernier plate, and half the usual number of graduations on the bar, simplify setting and reading. It is available in 12, 18, and 24-in. sizes (Oct 20, p196).

ROUGHNESS METER—*Cleveland Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* Model BK 6101 is designed to measure more surface shapes with fewer accessories. The pickup consists of the basic tracing cartridge for use on ID's as small as ¼ in., and the handle with its additional skids for checking OD's from 5/16 in. and ID's ⅜ in. and greater. Attaching wire guides to the handle permits measurement of surfaces as small as 0.030 in. OD (Oct 20, p194).

TAPE RULE — *Lufkin Rule Co, Saginaw, Mich.* MezurMatic has automatic re-wind. Blade is withdrawn manually; the pushbutton and re-wind mechanism acts as a brake and prevents blade from creeping. Rule is available in 6, 8, 10 and 12-ft lengths with regular ½-in.-wide blade, and in the ⅝-in.-wide Super MezurMatic in 10 and 12-ft lengths (Apr 21, p285).

THICKNESS AND DENSITY GAGE —*Budd Co, Nuclear Systems Div, 2450 Hunting Park Ave, Philadelphia 32, Penna.* Gammascan non-contacting gage continuously measures the thickness and density of material through the use of gamma radiation. The material thickness may range from light gage metal to more than a foot of steel or equivalent. Gamma radiation from Cobalt 60 source passes through material being inspected to a scintillation detector (Oct 20, p193).

MEASURING-WIRE HOLDER—*Distributed by Flynn Boring Tool Co, 133 Flowerdale, Ferndale 20, Mich.* Called the Third Hand, this device holds the three measuring wires over the thread while measuring external threads. Device eliminates juggling and does away with makeshift holders. It consists of a stainless steel bar with two sliding elements which adjust up and down the bar to accommodate different sized attained (Aug 11, p122).

SURFACE ROUGHNESS GAGE—*Micrometrical Mfg Co, 345 S Main St, Ann Arbor, Mich.* Tracer, with single-skid skidmount, measures on ID's and OD's as small as ¼ in. Motorized tracing is provided by the Mototrace. It gives a smooth, steady motion at a speed of 0.3 ips, with quick reversals, over any desired length of trace from 1/16 to 2¾ in. The Amplimeter shows arithmetical or rms average roughness height (Jun 30, p114).

THICKNESS GAGE — *Branson Instruments, Inc, 40 Brown House Rd, Stamford, Conn.* Model R Vidigage is comprised of ultrasonic resonance gaging and indicating circuitry, a strip chart recorder, gating and alarm circuits, and calibration control. Thickness of metals, glass and plastics between 0.005 and 2.5 in. can be measured. Readings are obtained by applying transducer to one side of work and reading thickness indication on instrument's screen and/or chart (Apr 21, p185).

THICKNESS GAGE — *Klopp Engineering Inc, 35551 Schoolcraft Rd, Livonia, Mich.* Mastertool 722 is marked in thousandths of an inch and also in metric equivalents. Device contains 25 blades ranging in thickness from 0.0015 in. (0.04 mm) through 0.035 in. (0.89 mm) (Mar 24, p160).

TRANSISTORIZED GAGE—*Cleveland Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* Indi-Ac Jr transistorized electronic gage measures 6 x 7 x 3¼ in. and weighs only 4¼ lb. Unit can be used on battery or on 110-v ac. Gaging direction is reversible; gaging pressure is approximately 6 grams. Three color-coded scales cover the range from 0.000020 to 0.020 in. (Oct 20, p196).

ELECTRONIC GAGE — *Taft-Peirce Mfg Co, Woonsocket, RI.* Versachek converts minute dimensional variations to voltage changes and amplifies them so that they can be read on a meter. Unit consists of electronic amplifier connected to pickup head, mounted on a comparator stand or height gage stand. Four magnifications are provided—400:1, 2000:1, 4000:1 and 20,000:1 (Apr 21, p200).

COMPARATOR HEAD—*B C Ames Co, Waltham, Mass.* Model No. AE-22 is designed for use with the company's Porta-Check portable transistorized comparator. Head has a measuring range of 0.006 in. on the thousandths scale and 0.0006 in. on the "tenths" scale. When used with the Porta-Check, this head reads to 0.00001 in. (Nov 17, p272).

COMPARATOR—*Imported by George Scherr Co, Inc, 200 Lafayette St, New York 12, NY.* Mechanical comparator, featuring the Super Compar-It gaging head, reads directly to 20 millionths and has a dial range of ±0.001 in. German-made instrument has cable-release arrangement for lowering and raising contact point. Price, complete with stand and bracket, is $102.50; indicating head alone, $70 (Oct 6, p142).

AIR GAGING CAPSULES — *Taft-Peirce Mfg Co, Woonsocket, RI.* These air gaging capsules are small, air-actuated pick-ups of the direct contact type that are used with any of the company's Compairator air gages to provide fast visual readout with quick response. Air capsules come in both plain and threaded body types, measure only 1½ in. long x 0.375 in. dia. The capsules are equipped with carbide contact points (Sep 22, p144).

TRANSISTORIZED INDICATOR — *Airborne Instruments Laboratory, Div of Cutler-Hammer, Inc, 160 Old Country Rd, Mineola, NY.* The battery-operated transistorized MICROtrol 170 is particularly suitable for surface plate or height gage work, checking setups, runout, or alignments of parts and machines. The indicator provides full-scale ranges of 0.0006 (magnification 770OX) and 0.006 in. (magnification 770X) (Dec 15, p137).

ELECTRONIC COMPARATOR — *Threadwell Tap & Die Co, Greenfield, Mass.* The S I electronic comparator consists of two basic parts—a gaging head with steel tip that is placed in contact with the workpiece, and an amplifier unit which records the magnified movement on an easy-to-read scale. Operational pressure of the gage is never more than 3 oz. Accessories include a comparator stand; signal light indicator; and a multi-gaging head attachment (Feb 10, p156).

GAGING STAND — *Moore Products Co, H & Lycoming Sts, Philadelphia 24, Penna.* M/C comparator is adjustable for amplifications up to 0.0004 full scale. The stand is equipped with a 4½-in.-dia indicator with "deadbeat" action and cushioned return. Pneumatic spindles and other gaging members fit a new "set-lock" mounting which permits rotation of the member and quick leakproof clamping (Apr 21, p268).

TRANSISTORIZED GAGES—*Pratt & Whitney Co, Inc, West Hartford 1, Conn.* Trans-O-Limit gages offer four magnifications, measuring in thousandths, ten-thousandths, and millionths. Gaging circuit operates at 5000 cps, making miniaturization of many components possible. Power unit can be used with height gage, external comparators, snap gages, or cartridge units (Dec 29, p78).

DIAL INDICATOR GAGE—*B C Ames Co, Waltham, Mass.* Heavy-duty Model S-2037-2 has measuring range up to 4 in., reading in 0.001 in. It has a built-in potentiometer, and can be used for visual and electrical indication of position or travel of slides, cam actions, worktables. Potentiometer provides electric feedback signal for controlling automated machines or equipment (May 5, p152).

ANGULARITY GAGE — *B C Ames Co, Waltham, Mass.* This gage solves the difficult problem of measuring angle degrees on compound curves, such as those found on turbine blades, missile parts and valve bodies. The user can now obtain a series of direct readings to check against a master (Apr 21, p269).

INDICATOR HOLDER — *Lufkin Rule Co, Saginaw, Mich.* Latest addition to Miti-Mite line is a magnetic-base indicator holder having a fixed or rigid center post. The 5/16-in. post is centered over the point of greatest magnetic pull, assuring positive settings for even heavy, lugback-type indicators (Apr 21, p273).

LONG RANGE INDICATORS — *B C Ames Co, Waltham, Mass.* Type B units may be used for measuring slide travel, motions, cams and other dimensions up to 10 in. range (Apr 21, p190).

GAGING AMPLIFIER — *Cleveland Instrument Co, 735 Carnegie Ave, Cleveland, Ohio.* Model AM-2000 is suitable for all types of automatic or semi-automatic gaging or machine control purposes. Basic amplifier actuates relays to classify parts into three categories, such as undersize, onsize and oversize. Category limits may be as small as 20 millionths or as large as 0.010 in. Max sorting rate is 10,000 parts per hr (Apr 21, p196).

DIAL INDICATORS — *Petz-Emery, Inc, Pleasant Valley, NY.* The Em-re dial indicator line now consists of 96 models in all four AGD groups—with bezel diameters of 1⅝, 2¼, 2¾ and 3⅜ in. Models include AGD ranges of 0.250, 0.125, 0.100, 0.075, 0.050 and 0.025 in., and are graduated in 0.001, 0.0005, 0.00025, and 0.0001 in. (Apr 21, p200).

TEST INDICATORS—*Federal Products Corp, 1144 Eddy St, Providence, RI.* Swiss-made indicators are available in L Series of eight models. Four have 0.0001-in. graduations with 0.032-in. range, and four have 0.0005-in. graduations with 0.060-in. range. They are furnished in both horizontal and perpendicular models. Two sizes of dials are available, one 1 in., the other 1½ in. (Jun 2, p136).

DIAL TEST INDICATOR — *Lufkin Rule Co, Saginaw, Mich.* Type 99 Two-Way indicator requires no switch levers or latches to reverse direction of operation. Pressure from either direction on contact point causes pointer hand to move in clockwise direction. High spots are always read to the right of zero. Indicator has a range of 0.030 in., graduated to 0.001 in., with a jeweled movement. Dial reads 0-15-0 (Apr 21, p235).

MULTIPLE-DIMENSION AIR GAGE — *Federal Products Corp, 1144 Eddy St, Providence, RI.* Model EAS-1058 air-electric meter switches have been assembled in multiple units to provide a multiple-dimension gage which eliminates borderline decision errors. The operator need observe only one large signal light which, when on, indicates that all dimensions are within tolerance (Apr 21, p208).

GAGE BLOCK COMPARATOR — *Cleveland Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* Unit designed specifically for the calibration of gage blocks consists of two opposed Micro-Ac gage heads, differential amplifier, and stand with worktable. Measurement is made from gage tip to gage tip, independent of the supporting surface of the table. Units can handle gage blocks up to 9 in. long (Oct 20, p193).

SQUARE GAGE BLOCKS — *Webber Gage Co, 12912 Triskett Rd, Cleveland 11, Ohio.* Blocks are 0.900 in. square with a ¼-in. (approx) hole for tie rods. They are available in chrome carbide or in standard steel in a complete range of sizes. Blocks can be purchased as individual or replacement blocks. Accuracies are standard A or B (Jan 13, p160).

GAGE BLOCKS—*Distributed by Engis Equipment Co, 431 S Dearborn St, Chicago 5, Ill.* Small gage blocks, measuring only ⅜ in. long by ⅛ in. wide, can form any combination between 0.1000 and 1.50000 in. in increments of 0.0001 in. These blocks can measure small bores, chordal dimensions across serrations, distance between cylinders located in serrations and splines, or space width of straight splines (Oct 6, p138).

HOLE LOCATION GAGE — *Reana Products Inc, PO Box 555, New Britain, Conn.* Holocator can be used to check size and location of holes in a part; to check the relation of a given surface to holes in the part; to check flange holes in relation to the center bore; to check pitch diameter of a gear; etc. Gage consists of a ground base plate, hardened and ground pin holders, and clamping yokes (Aug 25, p112).

CONCENTRICITY GAGES—*Zero Internal Gage Co, 11360 Schaefer Highway, Detroit 27, Mich.* Diversified line of gages is designed to check hole location, alignment, and concentricity, or to explore a hole to check whether it is tapered, out of round, or machined out of square. The gaging point is placed in line with indicator to show operator in which direction he is checking after gage has been inserted (Sep 8, p151).

ROUNDNESS GAGE — *Cleveland Instrument Co, 735 Carnegie Ave, Cleveland, Ohio.* Indi-Ron roundness, concentricity and squareness gage consists of a rotating table mounted on an ultra-precision spindle, with one or more Indi-Ac electronic indicators scanning the part. Measurements are plotted on a polar coordinate chart recorder synchronized with the rotation of spindle. Parts from 1/16 to 6 in. in diameter can be accommodated (Apr 21, p184).

SELF-SETTING SNAP GAGES — *Fletch-Aire Co, Inc, Vari-Gage Div, PO Box 1341, Sparta, NJ.* Snap gages reading to 0.001 in. are available with or without engraved scales. Model 300BB has a range of 0-2 in. and sells for $46.50. Model 300EE 2-5 in., sells for $55.50. The un-engraved models, covering the same ranges, sell for $33.50 and $39.50 respectively. These latter models must be set with size blocks (Feb 24, p174).

ROUNDNESS GAGE—*Cleveland Instrument Co, 735 Carnegie Ave, Cleveland 15, Ohio.* Model 1022 Indi-Ron roundness, squareness, and concentricity gage consists of a spindle with less than 0.000003-in. total rotational error, and an electronic gaging and recording system, all contained in a desk-size console. The unit measures deviation in roundness by change in radius of part as it rotated (Oct 20, p194).

GO—NO-GO GAGES—*K & K Grinding Co, 230 Richardson St, Brooklyn 22, NY.* Go—No-Go gages are furnished in sets of 13 gages each. Sets range in size from 1/16 to 1 in. In addition to the deluxe gage sets with Class XX accuracy—from size to plus 20 millionths, the company also offers, at a somewhat lower cost, sets in the Class X field—from minus 20 millionths to plus 40 millionths of an inch (Jun 30, p118).

FLUSH PIN GAGES — *Rite-O Tool & Gage Co, 321 West Ten Mile Rd, Hazel Park, Mich.* Line of standard bar- and barrel-type flush pin gages provides over 650,000 variations in the make-up of a gage. Either finished or blank gages can be supplied. The new dial indicator gage housing, designated Model R, is said to decrease dimensional errors and lower the cost of the unit (Jan 13, p164).

CONTOUR TRACER—*Optical Gaging Products, Inc, 26 Forbes St, Rochester 11, NY.* OGP Contour Transcriber, Model 8-18, is designed for non-destructive inspection of contoured parts. Unit makes a permanent record on specially coated glass of contours of master patterns, models, dies, molds, and similar parts. Device, designed for semi-automatic operation, handles contours up to 8 in. deep by 18 in. long (Jul 28, p110).

MAGNIFYING COMPARATOR—*Finescale Co, 218 S Western Ave, Los Angeles 4, Calif.* Known as the Finescale Magnifying Comparator, this small instrument can be fitted with a series of interchangeable reticles for checking and measuring radii, angles, chamfers, threads, small holes, lineal, radial and tangent dimensions, and odd shapes. It can also be used for checking gages, templets, layouts, forms and sizes of punches, dies (Nov 17, p262).

UNIVERSAL GAGE — *New Haven Trap Rock Co, Machine Products Div, North Branford, Conn.* Universal gage, designated Johan, can be used on parts ranging in size from 1/16 to 20 in. It measures OD's, ID's, concentricity, out-of-roundness, height and depth. Designed to check as many as six dimensions in one setting, this gage measures as accurately as 0.0001 in. Rapid resetting adds to its versatility (Jun 30, p112).

MINIATURE BENCH CENTER — *Taft-Peirce Mfg Co, Woonsocket, RI.* Designated No. 9205M, this bench center allows checking small work on centers either horizontally or vertically. Self-aligning shaft makes it possible for workpiece to be set in place quickly by loosening a single locking knob and sliding tailstock along aligning shaft. When tailstock locking knob is tightened, centers line up automatically (Aug 25, p102).

GAGES — *Huron Machine Products, Inc, 6252 Monroe Blvd, Dearborn, Mich.* Gages are made by choosing blank size closest to finished dimension, selecting corresponding handle, and then grinding and lapping gage blank to tolerance. Handles are aluminum and are available in Taperlock, Trilock or Reversible wire type styles. Blanks are stocked in approx 1/32-in. steps up to 1.010 in. (Apr 21, p236).

CALIPER THREAD GAGE—*Distributed by Production Equipment Co, Glenolden, Penna.* Horstmann caliper external thread gage (England) incorporates sets of Go and No-Go fixed jaws in a streamlined frame; it is designed to facilitate checking operations, and particularly to speed the handling of shouldered work. Numerous gaging positions can be obtained (Dec 1, p152).

THREAD PLUG GAGE—*Threadwell Tap & Die Co, Greenfield, Mass.* Thread plug gage, tradenamed Black Diamond, features increased resistance to wear and abrasion, which under normal operation, provides two to five times longer life than standard steel gages. Prices are the same as for standard steel gages (Nov 17, p256).

HEIGHT GAGE — *Brown & Sharpe Mfg Co, Providence, RI.* Magna-Set system is designed to take precision height measurements to any desired height. System uses a Hite-Icator for measurements to 10 or 20 in., with 9-in. raised blocks to build to greater heights. Dial indicator is actuated by gage-block column itself, as it moves up and down over the 1-in. range of micrometer head (Apr 21, p249).

HOLE LOCATION GAGE — *Sheffield Corp, Dayton 1, Ohio.* Designed to check hole center-distance or location, the Precisionaire Hole Coordinate Measuring Machine indicates true location of holes irrespective of diameter tolerances. Two models are available—one for areas up to 6 x 6 in. and one for areas up to 10 x 10 in. Other sizes on special order (Apr 21, p189).

THREAD GAGE — *Bryant Gage Div, Bryant Chucking Grinder Co, Springfield, Vt.* Lowcost split-plug-type thread segments for checking pitch diameter of internally threaded parts can be mounted on Bryant indicator-type thread comparators. Segments are available for NC, NF and NEF threads through 1 in., and, on request, for most special thread sizes from 5/16 to 5 in. (Apr 21, p192).

GAGING FIXTURE—*C E Johansson Gage Co, Dearborn, Mich.* CEJ Combination-Check 5000 offers the possibility of building inexpensive checking units from standard parts. Principal application is checking turned and ground circular components; several measurements can be made at same time. Parts from 0.200 to 2¾ in. dia and up to 20 in. long can be handled (Jun 2, p126).

BORE GAGES—*Brown & Sharpe Mfg Co, Providence, RI.* Dial bore gages are available in seven sizes to cover the entire range from ⅛ to 13 in. The AGD indicators (read in 0.0001 in.) in the two smaller sizes are graduated 0-5-0 with 0.025-in. range (Apr 21, p279).

EXTENSION HEIGHT BLOCK — *Machine Products Corp, 6771 McNichols Rd, Detroit 12, Mich.* Device makes it possible to move inspection equipment closer to the workpiece, eliminating the need for excessive extension arm lengths. Block is a one-piece Meehanite casting. Standard over-all height is 10 in., plus or minus 0.0005 in. (Nov 17, p250).

GAGING FIXTURES — *Wm L Riggs Co, PO Box 5002, Tulsa, Okla.* Fixtures for use with Ecopo-Check Jr comparator base include platen fixture which simplifies checking counterbore depths, offsets and groove locations. Gaging fixtures are available in both ground and hand-scraped finishes (Apr 21, p205).

INTERNAL GROOVE GAGE—*Boice Gages, Inc, Hyde Park, NY.* Dial gage checks internal groove diameters for dimensional accuracy. Portable gage can be used at machine or mounted on a bench stand. Indicator is graduated in 0.0005-in. increments and has a travel of 0.250 in. Range is adjustable from 0.750 (min) to 3.000 in. max dia. Max groove depth is ¾ in.; min groove width is 3/32 in. (Dec 29, p76).

RIGHT-ANGLE BORE GAGE—*Standard Gage Co, Inc, Poughkeepsie, NY.* Gage is useful for measuring work in jig borers, internal grinders and horizontal boring mills. Six sizes cover the range from ⅜ to 6¼ in. Sets are available comprised of a single dial unit and two interchangeable heads covering ⅜ to 1 in. (Jul 14, p121).

GROOVE GAGE — *A G Davis Gage & Engineering Co, 21435 Dequindre, Hazel Park, Mich.* Designed for use either at machine or in final inspection, gage is reported to eliminate many of the delicate, easily broken details of present groove gages. It will repeat to tenths. Gage can be supplied for standard O-ring and snap ring grooves with bores from 0.480 to 7.000 in. dia. (Apr 21, p198).

BORE GAGES — *Foster Supplies Co, 6122 Milwaukee Ave, Chicago 30, Ill.* Diatest bore gages measure hole diameters from 0.057 to 0.828 in. at depths to 3¼ in. without use of extension rods. New accessories available include a right angle attachment which permits bore gaging without removing workpiece from under bore spindle; extension rods which offer extensions up to 30 in.; and a depth adjuster (Apr 21, p250).

GAGE—*Boice Gages, Inc, Hyde Park, NY.* Miniature dial bore gage is capable of checking bores down to 0.032 in. Interchangeable heads make it possible to check any bore within the range of 0.032 to 0.064 in. (Jun 30, p118).

INSIDE DIAMETER GAGE — *Mueller Laboratory, 1052 N Allen Ave, Pasadena, Calif.* Instrument, said to be capable of repeating to within 0.0001, measures O-ring and Truarc ring grooves, odd grooves, bores, recesses, inside spherical radii, and out-of-round, conditions. Measurement range is from 0.187 to 6.875. Tips are designed to measure both O-rings and Truarc rings (Feb 24, p176).

INSPECTION and LAYOUT—gages and comparators, testing equipment

COATING GAGE — *Gulton Industries, 212 Durham Ave, Metuchen, NJ.* Glennite Laminagage, Model FLW-1, can be used for thickness measurements of metallic film or foil and will detect surface and subsurface cracks in smooth and rough coatings, flat stock, or plate and tubing. It can also be used to measure coating thicknesses of odd shaped pieces, and on assembly lines where coatings must be continuously monitored (Apr 21, p213).

LATHE AND DRILL GAGE — *Dawn Crafts Co, 215 Commonwealth Ave, Buffalo 16, NY.* Plastic device is printed with series of circles with diameters from ¼ to 2 in. Fine lines between circles locate centers of round stock with diameters from ⅝ to 1⅞ in. Ruled calibrations on sides can be used for locating matching dowel centers as well as for measuring diameters of round material (Jan 13, p170).

DRILL SHARPENING GAGE—*Eldorado Tool & Manufacturing Corp, 336 Boston Post Rd, Milford, Conn.* Gage facilitates sharpening of drills without use of expensive comparators or microscopes. Device can be made out of any piece of screw stock at least four drill diameters long. Different gage is needed for each drill diameter (May 5, p160).

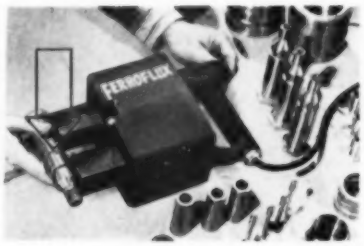
GEAR INSPECTION UNIT—*National Broach & Machine Co, 5600 St Jean, Detroit 13, Mich.* Red Ring unit automatically checks gears for both size and helix angle accuracy, rejects out-of-tolerance parts, and makes a chart record of measurements. A one-revolution check of size and helix angle accuracy is made by rotating the gear in tight mesh with a rotating upper master gear (Sep 8, p129).

THREAD LEAD CHECKER—*Pratt & Whitney Co, Inc, West Hartford 1, Conn.* Model A electro-mechanical universal lead tester combines the ability to check the lead of straight or taper threads, internal or external threads, and taper of threads or cylinders. Machine checks internal threads ranging from 1¼ to 16 in. diameter, and external threads from 0 to 16 in. Direct readings are made to 0.00002 in. for lead, and to 0.0001 in. for taper (Sep 22, p152).

GAGING-SORTING MACHINE—*Garrison Machine Works, Inc, 515-525 Bannock St, Dayton 4, Ohio.* Machine automatically gages, sorts and counts gears or other small parts into eight size categories at the rate of 1200 parts per hr. Simplified method of setup and changeover reduces downtime to a minimum and does not require specially trained operators. Unit operates on 110 volts and 70-psi air pressure (May 5, p152).

BORE GAGE — *Boice Gages, Inc, Hude Park, NY.* Latest addition to Tri-O-Set bore gage kit is Model 2/0 which, with the use of four extensions, covers range of 0.084 to 0.125 in. The complete kit, now consisting of four gages (with 15 extensions), covers range of 0.084 to 1.000 in. Adjustable setmaster replaces all master rings. Price for complete kit is $519.50; the 2/0 gage alone sells for $175 (Apr 21, p205).

MAGNAFLUX TESTING UNIT—*Magnaflux Corp, 7300 W Lawrence Ave, Chicago 31, Ill.* The NQ-242 employs the wet magnetic particle inspection method, either visible or fluorescent, and provides a rapid means for production testing of small ferrous parts up to 24 in. long. The suspended magnetizing coil and heads permit conveyorization of parts either through or across the unit (Aug 25, p110).



MAGNETIC INSPECTION UNIT — *Ferro Machine & Tool Co, 5514 W Washington St, Indianapolis, Ind.* Ferroflux, a lowcost, portable unit detects surface and sub-surface defects in ferro-magnetic materials. It weighs only 23 lb, consists essentially of a U-shaped, 110-v electromagnet. Poles are placed in contact with part. Current is turned on and local area is coated with solution. Particles in solution will concentrate at flaw (Jul 14, p121).

MAGNETIC PARTICLE TESTER — *Magnaflux Corp, 7300 W Lawrence Ave, Chicago 31, Ill.* Completely redesigned for rapid production testing of small ferrous parts up to 24 in. long, this unit is built for the new water-base wet magnetic particle method and accommodates the majority of part sizes tested in most industries. Features include larger, uncluttered work area; lower table height; conveniently located controls; suspended magnetizing heads and coils (Apr 21, p200).

ULTRASONIC INSPECTION UNIT — *Sperry Products, Inc, Danbury, Conn.* Model UR-600 reflectoscope provides greater sensitivity and higher resolution because of advanced pulser and receiver circuitry. Designed for locating surface and internal defects in materials, unit also spots differences in structure and physical properties, and can measure thickness. Other uses include inspection of welds and investigations of the effects of wear upon machine components (Dec 15, p134).

MAGNETIC INSPECTION EQUIPMENT—*Peterson Machine Tool, Inc, Meriam, Kan.* Sonoflux magnetic particle inspection equipment is designed to meet critical inspection demands. Available in a wide variety of portable and booth-type machines, these units provide identification of defects in ferrous materials and are rapid enough in operation to meet all production schedules (Oct 20, p198).

IMPACT WRENCH CALIBRATOR—*Skidmore-Wilhelm Manufacturing Co, 142 S Green Rd, Cleveland 21, Ohio.* Unit is designed for wrenches used with bolts up to 2½ in. in dia. Literature available (Jun 16, p169).

ULTRASONIC TESTING TRANSDUCER — *Branson Instruments, Inc, 40 Brown House Rd, Stamford, Conn.* Type Z transducer can be used on materials which have previously been difficult or impossible to test with standard transducers. Probe will detect flaws which are very close to surface of material. Immersion-mounted units are completely waterproof and operate at temperatures to 250 F (Jan 13, p168).

NON-DESTRUCTIVE TESTER—*Magnetic Analysis Corp, 42-44 Twelfth St, Long Island City 1, NY.* Testing unit utilizes eddy currents to inspect both nonferrous and non-magnetic metals. It is especially adaptable to production line or independent testing of tubing, bars and wire. Inspection speeds range from 200 to 600 fpm. Plug-in-type coils are available for testing material from ¼ to 3 in. OD (Oct 20, p196).

ELECTROMAGNETIC FLAW DETECTOR—*Metrol, Inc, 17 E Holly St, Pasadena, Calif.* Radac, a non-destructive, automatic flaw detector, permits rapid 100% inspection of metal tubing and bars right on the production line, at speeds from 50 to 500 fpm. Device checks flaws, physical properties and dimensional variations in metal tubing, bar stock, flat stock and wire. It handles both ferrous and nonferrous metals, in all diameters (Sep 22, p142).

CRACK DETECTOR — *Magnaflux Corp, 7300 W Lawrence Ave, Chicago 31, Ill.* Magnatest ED-500 eddy current instrument locates and determines the relative seriousness of defects in all conductive materials. It also quickly sorts mixed lots of ferrous and nonferrous metals for differences in hardness, alloy, and heat-treat condition. Unit consists of an indicating unit, inspection probe, and power line cord (Oct 20, p194).

PORTABLE CRACK DETECTOR — *United States Casting Repair Corp, 2500 E York St, Philadelphia 25, Penna.* Seal-Lock magnetic crack detector locates and outlines any surface crack or fault on any ferrous casting. Device operates on the principle of magnetic particle inspection. Unit weighs 20 lb and is easily operated by one man, from either a 110-v line, 12-v or 6-v battery (Sep 8, p148).

PORTABLE REFLECTOSCOPE — *Sperry Products, Inc, Danbury, Conn.* Type US weighs 35 lb, measures approximately 9 in. wide, 19 in. deep and 14 in. high. Controls are simplified to four knobs; single transistorized automatic alarm is readily attached. Applications include ultrasonic inspection without disassembly of plant machinery, inspection of studs, bolts, welds, forgings (Jul 14, p138).

TESTING MACHINE — *Tinius Olsen Testing Machine Co, 7275 Easton Rd, Willow Grove, Penna.* Data is printed automatically by an electric typewriter used in conjunction with this Electromatic machine. As set, the data printer will record yield strength by desired percentage of offset, ultimate strength and an identifying test number, without operator attention. With this unit, a series of tensile tests can be conducted in rapid sequence (Jan 13, p162).

MOTORIZED SPRING TESTER—*Imported by Testing Equipment Co, Inc, 15 William St, New York 5, NY.* Elasticometer FOL-250 (German) motorized spring testing machine can be adjusted for two ranges—0 to 110 lb and 0 to 550 lb. Tester is good for about 2500 tests per hr and can be used for permanent setting of springs. Weighing accuracy is ± 1%; sensitivity is 0.001 lb. Compression and tension springs up to 5½ in. dia and 19¾ in. free length can be tested (May 5, p156).

COMPRESSION TESTER — *Steel City Testing Machines, Inc, 8817 Lyndon Ave, Detroit 38, Mich.* Low-capacity compression tester, Model CT-134, is operated by turning knob at bottom of tester. Measuring system incorporates bourdon-type gage, cylinder and piston, and a trapped oil reservoir. Unit has capacity of 300 lb, occupies space of 11 x 6 in., and stands 26 in. high. Vertical opening adjustable from 4 to 5½ in. (Mar 24, p156).

TESTING MACHINE — *Cal-Testing Machine Co, 2735 S Robert Blvd, Los Angeles 34, Calif.* Cal-Tester, designed for operation in horizontal position, has now been modified for vertical use also, with testing area in an up or down position. Machine and gages are mounted on a portable stand and can be detached for horizontal operation (Jun 16, p158).

ELASTIC LOOP DYNAMOMETERS — *Gries Industries, Inc, New Rochelle, NY.* The Gries-Wazau elastic loop dynamometers are designed to speed the checking of tensile and compressive loads in testing machines. An important feature of these instruments is their optical reading arrangements, which utilize Zeiss spiral measuring microscopes to obtain direct readings of elastic deformations as close as 0.0001 mm (Oct 20, p200).

HARDNESS TESTER — *Wilson Mechanical Instrument Div, American Chain & Cable Co, Inc, 929 Connecticut Ave, Bridgeport 2, Conn.* TwinTester combination Rockwell and Rockwell superficial hardness tester is capable of measuring the hardness of metals and alloys of all types whether hard or soft, polished or unpolished, round, flat, tubular or irregular in shape. Vertical capacity is 8, 12 or 16 in., throat depth is 5½ in. (Apr 21, p200).

HOT HARDNESS TESTER—*Wilson Mechanical Instrument Div, American Chain & Cable Co, Inc, 929 Connecticut Ave, Bridgeport 2, Conn.* Model 6-JR Hot Hardness Tester, utilizing a Rockwell tester in conjunction with a small electric furnace, measures the hardness of metals contained within the furnace at temperatures exceeding 1500 F. Such tests provide data on structural phenomena as metals change in character when heated and subsequently drop to room temperature (Jul 28, p110).

HARDNESS TESTER — *Distributed by Opto-Metric Tools, Inc, 187 Varick St, New York 13, NY.* Frank (German) unit incorporates an arrangement whereby eight different loads are selectively available by pushbutton control. Tests include Rockwell C by Brale penetrator; Rockwell B by 1/16-in. steel ball; Brinell by 2.5, 5, and 10-mm steel balls; Vickers by 136° diamond penetration (Mar 10, p190).

MICRO-HARDNESS TESTER—*Newage Industries, Inc, 222 York Rd, Jenkintown, Penna.* Lowcost tester utilizes a virtually frictionless hydraulic method to load a diamond indenter, which supplies a direct reading corresponding to Vickers diamond pyramid hardness number. Testing takes only 15 seconds, and is suited for hardness testing of instrument parts, surface layers, thin materials, tips of cutting tools, wire punches (Jul 28, p103).

HARDNESS TESTER—*King Tester Corp, 440 N 13th St, Philadelphia 23, Penna.* Portable model for testing interior walls of cylinders or cylindrical openings within engine blocks and castings uses a 5 or 10-mm carbide ball with loads ranging from 500 to 1500 kg. Instrument can be furnished for openings with minimum dia of 6 in. and can make tests at a depth of 10 in. or more. Extensions can be furnished (Jul 28, p108).

HARDNESS TESTER — *King Tester Corp, 440-44 N 13 St, Philadelphia 23, Penna.* Designed to make Brinell end hardness tests on cylinders, die blocks and large castings, this machine has a capacity of 29 in. or more with a throat of 3¼ in. Instrument weighs 45 lb and can be used in any position. It uses a 5-mm or 10-mm carbide ball with any load up to 3000 kg. Unit is equipped with rollers (Apr 21, p263).

BRINELL HARDNESS TESTER — *Steel City Testing Machines, Inc, 8817 Lyndon Ave, Detroit 38, Mich.* Semi-automatic machine for high-production testing determines the work position before it can operate. Precision limit switch located in the table fixture must be depressed by the part before the knee-actuated cycle-switch becomes energized. Colored lights on the machine indicate relative hardness of the part (Oct 20, p218).

PORTABLE VIBRATION ANALYZER—*International Research & Development Corp, Box 55, Worthington, Ohio.* Model 311 serves as vibration analyzer, portable in-place balancer, and system to monitor vibration in machinery. Instrument presents peak-to-peak displacement in ranges of 10 mils, 1 mil, and 0.1 mil. Variable frequency filter permits separate analysis of each frequency from 500 to 5000 cpm (Jul 28, p108).

CUTTING SPEED COMPUTER — *Kennametal Inc, Latrobe, Penna.* Kennametal Cutmeter puts into convenient form the relationships of feed, speed, depth of cut, power, etc, that have been established through metal cutting research. It can be used to evaluate metal cutting conditions or for establishing machining practices on new operations (Jul 28, p104).

DYNAMIC BALANCING MACHINE—*Gisholt Machine Co, Madison, Wis.* Type HS balancing machine balances parts weighing anywhere from ½ oz to 10 lb, at speeds from 4000 to 12,000 rpm, with an accuracy represented by 0.000002-in. displacement of the supporting bearings. Either a strobe or photocell circuit can be used for unbalance detection. A precision drill-press is available for correction drilling (Dec 15, p95).

BALANCING MACHINE — *Tinius Olsen Testing Machine Co, Easton Rd, Willow Grove, Penna.* Rava (Italian) static-dynamic balancing machine employs an electrical measuring system. Both the angle and the amount of unbalance are determined by adjusting simple electrical controls. Workpiece is rotated at speeds up to 3600 rpm by direct motor drive. Machines are available in a wide range of sizes (Feb 24, p173).

DYNAMIC BALANCING MACHINE — *Raydyne Corp, Springfield, Ill.* Raydyne Automatic System, designed for handling rotors, uses a seismic-mounted, electronically controlled unbalance indicator with a force absorption device that automatically stops all motion caused by unbalance, and affords accurate balance testing with first run of rotor. System is offered as custom-built equipment in several models (Jun 30, p120).

INDUSTRIAL BALANCER—*Stewart-Warner Corp, Alemite Div, 1826 Diversey Pkwy, Chicago 14, Ill.* Model 702 is capable of balancing to 0.004 oz-in. all rotating parts weighing between ¼ lb and 300 lb and measuring from ¼ to 30 in. diameter. Kinetic and dynamic unbalance are determined electronically at the mechanical resonance of rotor and vibratory system (Mar 24, p160).

GEAR TESTING MACHINE — *Imported by Kurt Orban Co, Inc, 34 Exchange Pl, Jersey City 2, NJ.* S & F (German) Model 126 gear tester will support gears up to 4500 lb, yet maintain a sensitivity and repeatability within 0.00001 in., even with maximum loads. Max center distance is 5½ ft. Errors are recorded on a mechanical recording comparator (Apr 21, p199).

DIAL INDICATOR CHECKER—*B C Ames Co, Waltham, Mass.* Barrel of device is accurate to 30 millionths of an inch. Graduations on its 8-in.-dia ring were found to be accurate to 2 sec of an arc of the circumference. Tester proved capable of checking indicators with ranges up to 1 in., direct to 0.0001 in. (Nov 17, p244).

GEAR TRAIN ANALYZER—*Daco Instrument Co, Tillary and Prince Sts, Brooklyn 1, NY.* Machine analyzes lost motion in precision gear trains. Torque actuator (A) with read-out dial (B), calibrated in degrees to indicate angular displacement of the actuator shaft during test of locked gear train, is connected to electronic control console (C). Unit also can be used for gear mesh adjustment and gear alignment (Jan 27, p280).

OPTICAL COMPARATORS—*Jones & Lamson Machine Co, Springfield, Vt.* The 14-in. optical section comparator (left) is designed to inspect turbine blades and vanes. It checks the contours of the blade edges and the fairing between the edge contour and the foil contour. The Model FC30ER extended range comparator (right) inspects extra-large heavy parts. It offers 80 sq in. of measuring area, up to 10 in. of lateral measurement and 8 in. of vertical measurement (Aug 11, p121).

COMPARATOR UNIT — *Royal Oak Tool & Machine Co, 29800 Stephenson Highway, Royal Oak, Mich.* Optical comparator attachment, for company's R-O Universal Form Relieving Fixture and Grinder, mounts on a bracket attached to the grinder. It swings from an out-of-the way position, bringing the lens over the work and projects the ground profile, with 20:1 magnification, on the 8-in.-dia screen (Jun 2, p124).

COMPARATORS — *Stocker & Yale, Inc, Marblehead, Mass.* Designed specifically for low-magnification work in the 3X to 20X range, this series of production projectors features large area screens, long working distances, and wide field coverage. The projectors may be used under ordinary room lighting conditions without curtains or enclosures (Aug 25, p101).

OPTICAL COMPARATOR—*Bausch & Lomb Optical Co, Rochester 2, NY.* A surface illuminator and a protractor ring have been added to the company's standard bench comparator. Surface and projection illumination may be used simultaneously. The protractor ring consists of a fixed ring assembly, graduated ring, vernier scale, and clamp arrangement (Apr 21, p183).

OPTICAL COMPARATOR — *Portman Instrument Co, Town Dock Rd, New Rochelle, NY.* Big Twin Eighteen Model, with 18-in.-dia screen, can be used either as a vertical (floor-type) unit or in a horizontal (bench-type) position. Lenses to provide magnifications of 10X, 20X, 25X, 31¼X, 50X, 62½X, and 100X are available as standard equipment (Feb 10, p172).

OPTICAL COMPARATORS — *Jones & Lamson Machine Co, Springfield, Vt.* 14-in. unit checks leading and trailing edges of turbine blades and vanes. Blades can be from 1 to 9 in. long with chord lengths up to 5½ in. Heavy-duty 30-in. model has a 32-in. table, 8-in. vertical travel, 10-in. horizontal travel, and table helix adjustment of 15°. Magnification from 10X to 100X (Apr 21, p179).

OPTICAL COMPARATOR CHARTS — *Optical Gaging Products, Inc, 26 Forbes St, Rochester, NY.* Chart-gages can be produced in any shop by using plastic material called Fast-Line. Chart-gages are prepared on this 0.050-in.-thick material by scribing desired layout, then brushing over the lines with a dye-like fluid. After dipping in wash to remove excess fluid and scribe coating, chart is wiped dry and is ready for use (Apr 21, p263).

OPTICAL COMPARATOR — *George Scherr Co, 200 Lafayette St, New York 12, NY.* Micro-Projector offers many features not usually found in a unit in this price range ($395)—a horizontal stage onto which flat work can be placed without need for holding fixtures; a comfortably inclined 14-in. viewing screen; a choice of fixed standard magnifications (10X to 100X) (Apr 21, p193).

X-RAY INSPECTION — *American Chain & Cable Co, Reading, Penna.* Large castings are X-rayed by a large Van de Graaff generator supplying two-million electron volts. Smaller parts are exposed to a shielded pellet of Cobalt 60. By grouping the parts around the pellet many pieces can be inspected in one operation. This team of equipment has multiplied radiographic-inspection capacity by 8 or 9 times (Oct 6, p91).

OPTICAL FLATS—*Crane Packing Co, Dept AMN, 6400 Oakton St, Morton Grove, Ill.* Optical flats are available in either clear fused quartz or Pyrex glass. They are supplied in two certified accuracies, 1/10 or 1/5 light band. Both types are double surfaced to avoid reading errors. Known as Lapmaster Optical Flats, they are furnished in standard sizes from 1 in. through 12 in. dia (Nov 17, p276).

OPTICAL VERNIER—*Simpson Optical Manufacturing Co, 3200 W Carroll Ave, Chicago 24, Ill.* Vernac indicates longitudinal, lateral, or vertical position of any machine tool table to an accuracy of 0.0001 in. without interpolation. Hardened scale is affixed to table. Scale readings are projected onto an illuminated, highly visible, direct reading dial. Readings are in 0.025-in. intervals, can be refined on the order of 0.0001 in. (May 19, p157).

MICRO-PROJECTOR — *Distributed by Opto-Metric Tools, Inc, 157 Varick St, New York 13, NY.* Wilder Model A-F Micro-Projector is available in six selective magnifications (10X to 100X) and with a variety of measuring stages, centers, surface illumination, protractor, as well as measuring screens (Apr 21, p238).

PORTABLE RADIOGRAPHY UNIT — *Philips Electronics, Inc, Instruments Div, 750 S Fulton Ave, Mount Vernon, NY.* Lightweight Model MG 100 is powerful enough for tasks involving steel welds and opaque materials such as aluminum, magnesium, plastics. The 45-lb unit is housed in a steel case measuring 16 x 12 x 6¾ in. Kilovoltage regulation is continuously variable from 30 to 100 kvp. It is designed for virtually continuous operation (Mar 24, p170).

X-RAY IMAGE AMPLIFIER—*Picker X-Ray Corp, 25 S Broadway, White Plains, NY.* Inspection unit uses electronic equipment to amplify an X-ray image and transfer it to a television screen. Image is bright enough for viewing in normal light. System consists of the electronic image amplifier, X-ray generator, and a control. In addition to the direct viewing method, a television monitor and a movie camera can be used with the system (Dec 15, p132).

X-RAY INSPECTION—*General Electric Co, X-Ray Dept, Industrial Section, Milwaukee 1, Wis.* Designed to automate quality control, the TVX X-ray image intensification system permits economical 100% product inspection on a television-type screen, 10,000 times brighter than a conventional fluoroscopic image. Viewing monitor provides product inspector with an image size which is electronically variable from ½ to 3 times that of the subject (Oct 20, p205).

STEREO MICROSCOPE — *Edmund Scientific Co, Barrington, NJ.* Standard pair of wide field 10X Kellner eyepieces give 23 and 40 power. Heavy base allows unit to swing around, move up or down, or rotate on its axis. Total horizontal travel is 360° in a circle, 11 in. toward and away from support post. Vertical travel is 14 in. Price of base and scope is $144.50 (May 19, p187).

TOOLMAKER'S MICROSCOPE — *Do-All Co, Des Plaines, Ill.* Instrument, manufactured by Bausch & Lomb, is designed for inspection and measurement of drills, taps, jigs, templets, broaches, milling cutters, reamers and small work parts. Working distance is 4 in., permitting focus on objects up to 2½ in. in depth. Range of magnification with interchangeable eyepiece and objective lenses is 27X to 360X. Standard lenses supplied give 35X (Feb 24, p158).

OPTICAL INSTRUMENTS — *Gaertner Scientific Corp, 1201 Wrightwood Ave, Chicago 14, Ill.* Toolmakers microscope with closed-circuit TV system produces an image on a TV screen for remote or multiple viewing. Other instruments include an optical instrument for measuring expansion or contraction of materials; a toolmaker's microscope with binocular viewing eyepiece; and a toolmaker's microscope with interferometer attachment (Apr 21, p198).

METALLURGICAL MICROSCOPE — *Gries Industries, Inc, New Rochelle, NY.* The Gries-Olympus metallurgical microscope is an inverted-type instrument designed for rapid inspection of metal specimens. Features include oil immersion lens and three eyepieces, which give magnifications to 1800X; and an optional eyepiece for 2400X magnification (Oct 20, p195).

BLADE-EDGE MICROSCOPE — *Engis Equipment Co, 431 S Dearborn St, Chicago 5, Ill.* Instrument permits critical checking of leading and trailing edges of turbine and compressor blades; not only their radii, but also the blending of radii with flanks of blade. Image seen is a normal cross-section which can be compared directly with master drawing. Blades up to 2½ in. wide can be checked with magnification of 40X (Feb 24, p180).

MACHINE TOOL MICROSCOPE — *Distributed by Opto-Metric Tools, Inc, 137 Varick St, New York 13, NY.* Locating microscope designed for use in jig borers and similar precision machine tools combines a 25X total magnification with a fairly large field. Eyepiece contains a hairline cross and is adjustable for individual focusing. Standard shanks are ½ in. straight, No. 2 and No. 3 Morse taper. Instrument is made by Leitz-Wetzlar, West Germany (Jul 14, p139).

AUTOCOLLIMATION EYEPIECES — *Wild Heerbrugg Instruments, Inc, Port Washington LI, NY.* Eyepieces extend use of the Wild T-2 and T-3 theodolites in optical tooling operations. Total telescope magnification of 22X is achieved with the T-3 which gives a reading accuracy of 0.2 sec of arc. T-2 magnification is 18X with reading accuracy of 1 sec. Units are interchangeable with standard telescope eyepieces (Oct 20, p236).

OPTICAL COINCIDENCE UNIT — *W & L E Gurley, Troy NY.* Optical coincidence reading system, designated Unisec, makes it possible to read shaft positions to one second of arc directly. Device is expected to have many uses in industry—especially in the initial positioning operation in tooling, where costly error can be forestalled. The Unisec is basically an angle-reading device (Mar 24, p156).

OPTICAL GAGE—*Distributed by Do-All Co, Des Plaines, Ill.* Model DR-25, developed by Bausch & Lomb Optical Co, measures depth, thickness, height, and diameter. Measuring range is continuous from 0 to 3 in. with no masters or set gages needed. Measurements are read directly on an illuminated, magnified scale graduated in least-reading intervals of 0.0001 in., with an accuracy of 0.000025 in. (Jun 16, p127).

SCRIBING MACHINE—*Optical Gaging Products, Inc, 26 Forbes St, Rochester 11, NY.* Model A-14 scribing machine produces optical comparator layouts on glass or plastic. Designed for accuracy of 0.001 in. or better, machine features free-floating table and scribe carrier to speed layout work. Table area of unit accommodates glass or plastic chart material up to 14 in. in diameter and 11 x 14 in. rectangular (Jul 14, p126).

TRAVEL INDICATOR—*M E Hodge Corp, 36 N Raymond Ave, Pasadena 1, Calif.* Trav-A-Dial, for use with any machine tool, measures complete longitudinal travel of the machine as well as transverse and vertical travel on certain tools. Instrument reads any length in 6-in. increments, furnishing a visual record in inches, hundredths and thousandths on a large, easily read dial (Jun 2, p130).

LATHE INDICATOR—*La Fan Co, 1956 S Earlington, Duarte, Calif.* Tone-emitting device, containing a transistorized circuit, warns lathe operator before point of feed shutoff is reached. Sound generated is of a frequency above that of shop noise level. Tone continues for approximately one-hundred thousandths of indicator sweep, providing adequate notice of shutoff time (Jul 14, p144).

TEMPERATURE MONITOR—*Mason Instrument Co, 29 Elm Ave, Mount Vernon, NY.* Pyrotrol can be used with induction heaters, crucibles, gas flame or torch, or furnaces. Optical system points at the work, focuses the infrared radiation which it emits upon a photocell whose output signal is amplified, triggering an electronic relay which can shut off a heater, sound an alarm, or perform other tasks (Jun 16, p154).

OPTICAL PYROMETER—*Pyrometer Instrument Co, Inc, Bergenfield, NJ.* Known as the Pyro Micro-Optical Pyrometer, this instrument is capable of measuring targets less than 0.001 in. dia. Also available is the Model DR-35 surface pyrometer that features a dual temperature range. The low range is 0-500 F; the high range, 0-1500 F (Oct 20, p200).

TEMPERATURE INDICATING DEVICES—*Tempil Corp, 132 W 22 St, New York 11, NY.* Tempilstik temperature indicating crayons are now available in ratings of 305, 320, 330 and 345 F, filling the need for closer temperature-interval calibration. Tempil Pellets have been extended in range by new pellets for 2550, 2600, 2650 and 2700 F (Oct 20, p202).

DIGITAL TORQUE INDICATOR — *Performance Measurements Co, 15301 W McNichols, Detroit 35, Mich.* Model DTI-2 uses a precision servo null-balance system of measurement to provide continuous digital presentation of torque values, in in.-lb or ft-lb. Used with an auxiliary slidewire, the unit can provide direct horsepower readings. Indicator operates on 115-v, 60-c alternating current (Nov 17, p276).

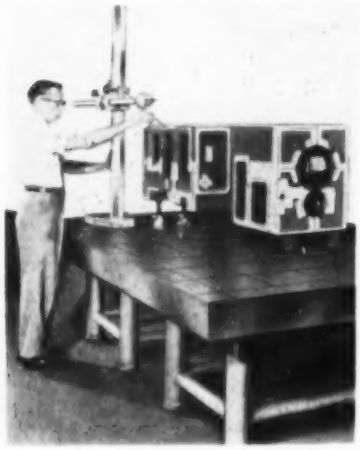
SPEED DETECTORS — *Torq Engineered Products, Inc, 32 W Monroe St, Bedford, Ohio.* Synchro-Snap speed detectors can incorporate up to eight separate speed-sensing switches in one aluminum housing that measures 5 in. in dia by 4 in. deep. Each switch controls one circuit which can be actuated by a high speed limit and a low speed limit. They can be supplied in accuracies of ¼ of 1% (Jul 14, p138).

MACHINE LOAD INDICATOR—*Futurmill, Inc, 6360 Highland Rd, Pontiac, Mich.* Tool-Gard is a dual-purpose load measuring instrument for use on any machine tool. It gives constant visual tool wear indication or it can monitor machine tool overload or underload (Jun 16, p147).

TACHOMETER—*Distributed by Epic, Inc, 154 Nassau St, New York 38, NY.* Deumo 2 (German) precision tachometer for measuring revolutions and surface speeds has range from 40 to 50,000 rpm divided in three speed ranges. Special models with ranges up to 20,000 and 30,000 are also available. Instrument determines the rpm with an accuracy of 0.5% (Feb 10, p182).

STEEL ANALYZER—*Fisher Scientific Co, 717 Forbes St, Pittsburgh 19, Penna.* The Fisher Induction Carbon Apparatus determines the amount of carbon in steel by burning a steel sample is a stream of pure oxygen, heating it with a radio-frequency induction coil. The whole process, from the time the analyst pushes the "start" button, is carried out automatically in about two minutes. The apparatus sells for $975 (Oct 20, p202).

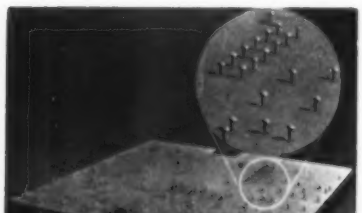
RAM PRESSURE GAGE — *Studebaker Hydraulic Products Co, 1733 N 33rd Ave, Melrose Park, Ill.* Total pressure gage is designed for direct, accurate reading of total pressure of ram-on-work in presses and other machine tools where controlled pressures are required. It is available in three standard sizes, 10,000, 20,000 and 100,000-lb capacities (Feb 10, p162).



LAYOUT MACHINE—*Portage Double Quick, Inc, 1026 Sweitzer Ave, Akron 11, Ohio.* PDQ layout machine lays out and scribes work from five sides and on inside surfaces with only one setting of the casting. Workpiece or casting does not have to be clamped. Machine lays out and scribes vertical and horizontal lines on workpieces, up to 48 in. vertically and 36 in. horizontally (Jun 30, p114).

MICRO-SCRIBER — *Wm L Riggs Co, PO Box 5002, Tulsa, Okla.* Tool permits tool designers and layout men to scribe circles with diameters of 0.020 to 0.250 in. (Apr 21, p239).

HOLE CENTER FINDER — *James Products Co, 801 Mentor Ave, Mentor, Ohio.* In one simple operation the tool transfers the location of a hole, establishes the center point of the hole, and marks the point for easy drill location. Tool can be used on metal, plastic, wood or any other material. It comes in kit form, consisting of one center punch and eight sleeve plugs. Sizes range from 5/16 to ¾ in. (Nov. 17, p267).



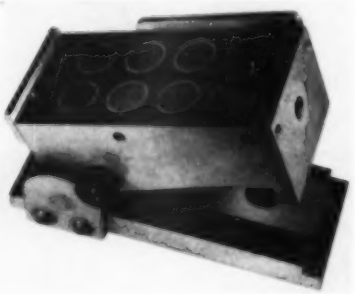
GRANITE SURFACE PLATES—*Eahn Granite Surface Plate Co, 644 N Western Ave, Dayton 7, Ohio.* Diabase (black granite) surface plates are now available with threaded steel inserts, to facilitate attachment of various components to the plate. The inserts are so designed that, when they are cemented into holes drilled in the granite, they are stronger than the machine screws used (Nov 17, p243).

LAYOUT FLUID APPLICATOR—*Dykem Co, 2301-B N 11 St, St Louis 6, Mo.* Fountain Brush consists of a soft-hair brush with hollow handle attached to a squeeze bulb; the whole assembly is joined to the screw-cap of the nonbreakable bottle. One charging of the bulb will provide enough fluid to cover about 350 sq in. of metal surface. Price is $1.75 (Jun 30, p118).

LEVEL AND ANGLE FINDER—*Research Engineering and Sales Co, 1014 Longfellow, Royal Oak, Mich.* The Emerson Combination has a symmetrically divided protractor with a red pointer, designed for easy, direct reading. Compensating screw permits setting of angles in relation to other angles. Tool is easily zeroed-in (Oct 6, p146).

MAGNETIC PARALLELS — *Distributed by Research Engineering & Sales Co, 1014 Longfellow, Royal Oak, Mich.* Magnetic parallel bars with independent surfaces have three Alnico magnetic inserts on one side, two on the other, thus can be used on both sides simultaneously. Available in matched sets, units are 1 in. x ¾ in. by 5½ in. The 1-in. and the ¾-in. sides are precision ground to +0.0002 and —0.0000 in. (Sep 22, p161).

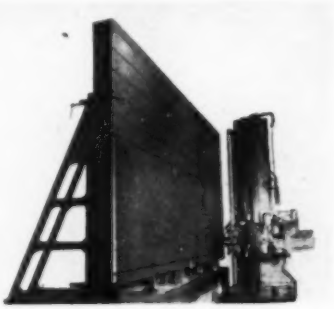
BEARING BLUE — *Dayton Rogers Manufacturing Co, 2824 13th Ave S, Minneapolis 7, Minn.* Compound locates the high spots for hand scraping or fitting of all bearings and surfaces. Ability to transfer from gage to surfaces being tested has been improved. Sample is available when requested on company letterhead (Jun 16, p155).



LIGHT-DUTY SINE PLATE — *Bald Eagle Corp, 356 Cedar St, St Paul 1, Minn.* Unit speeds light machining or inspecting of angles on small ferrous parts. The 5 x 3-in. top surface provides ample working area, and rails on side and end make accurate locating of pieces easy. Permanent magnet holds a piece securely for light machining (Sep 22, p146).

LAYOUT TOOLS — *Challenge Machinery Co, Grand Haven, Mich.* Tooling angle, made of lightweight magnesium, has expandable sections so that height can be increased as desired. Other new items include dove-tail straight edges and slotted angle plates (Apr 21, p287).

PRECISION CENTER PUNCH — *Moran Instrument Corp, 170 E Orange Grove Ave, Pasadena, Calif.* Micro-Punch for rapid marking of any flat surface combines a microscope with a precision automatic center punch. Punch mark is made by an indenter point set in base of hammer. Cross hairs in reticle provide exact sighting point. Accuracy of better than 0.001 in. is claimed (Apr 21, p212).



LAYOUT PLATES—*Machine Products Corp, 6771 E McNichols Rd, Detroit 12, Mich.* Layout plates, with machined T-slots in any arrangements specified, are available in sizes up to 10 x 20 ft, in one piece or in sections. All plates can be supplied with 2-in. clamping ledges on both sides and ends, and, if desired, plates can be furnished with machined grid lines (May 19, p162).

PUNCH AND DRILL JIG SET—*Middlesex Engineering & Mfg Co, Box 358, Rocky Hill, Conn.* Standard set containing five collets, a sleeve, and a punch, can be used on material of any thickness from 0.001 to over 6 in., according to application. Set covers all sizes in 0.0001 from 0.240 to 1.190 in. inclusive. Applications include use as drill jig; transferring holes from master templet; scribing layout lines; spotting hole from die to die set (Jun 2, p122).

ANGLE PLATES—*Challenge Machinery Co, Grand Haven, Mich.* Magnesium angle plates are available in four heights: 24, 30, 48, and 72 in. Special units up to 120 in. can be supplied. Models have hardened steel runners so they can be used on semi-steel surface plates without wearing. They are also provided with 8 x 8-in. hardened steel plates to which standard magnesium height blocks can be fixed (Jul 28, p116).

American Machinist 1959 PRODUCTION PREVIEW

PLANT SERVICE EQUIPMENT

FORK LIFT TRUCKS—*Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* Clarklift Electric Line, utilizes a new type of "carbon pile" drive control which provides constantly smooth acceleration from standstill to full maximum speed and permits full control of inching during operation. The 2000-lb model, the EC-20, travels up to 6.5 mph both forward and reverse and has a lift speed, loaded, of 50 fpm (Jun 16, p130).

INDUSTRIAL TRUCK — *Lewis-Shepard Products, Inc, 125 Walnut St, Watertown 72, Mass.* Rider-design, electric-powered JackStacker trucks are available in capacities from 1500 to 3000 lbs, with either forks or platforms. Trucks have over-all lengths of 81, 87, 93, 99, or 105 in. On models with telescopic masts, platform or fork elevations range from 101 to 129 in. (Jul 28, p141).

ELECTRIC TRUCK—*Raymond Corp, 47-165 Madison Ave, Greene, NY.* Electric truck that operates in aisles as narrow as 78 in. stacks 4000-lb pallet loads up to 192 in. Heavier, redesigned uprights provide the additional 40 in. of lift over previous limits (Aug 11, p143).

STACKING TRUCK — *Automatic Transportation Co, 149 W 87th St, Chicago 20, Ill.* Electric-powered, pallet-type straddle stacker, Model WAT, has been shortened to make unit more adaptable for narrow aisles. Lift is up to 130 in. with standard uprights of 83 in. Model is available with either Mono or Duo masts. Capacity is 4000 lb with telescopic uprights, 6000 lb with non-telescopic (Mar 24, p156).

INDUSTRIAL TRUCK — *Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87th St, Chicago 20, Ill.* New design of Transporter Models WPY 4 and 6 (4000 and 6000-lb low-lift pallet industrial trucks) provides space for 50% additional power as compared with conventional types. Battery compartment has been enlarged to 15½ in. (Feb 10, p185).

FORK TRUCKS—*Elwell-Parker Electric Co, 4205 St Clair Ave, Cleveland 3, Ohio.* Electric-powered fork trucks are available with capacities of 4000, 6000, 7000, 8000 and 10,000 lbs. All models feature front-wheel drive and rear-wheel steer for maneuverability. Features include contactor control with automatic acceleration; four speeds forward and reverse (Jun 30, p112).

PALLET TRUCK—*Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87th St, Chicago 20, Ill.* Model WPY-15 Transporter is designed to handle 15,000-lb steel coils on 52 x 52-in. pallets. Unit is 32¾ in. wide with 72¼-in. over-all length. Forks are 5 in. high in low position and have a 5½-in. lift (May 5, p148).

LIFT TRUCK—*Allis-Chalmers Mfg Co, Engine-Material Handling Div, Milwaukee, Wis.* Model FT 20-24, 2000-lb-capacity truck, available for gasoline or LP fuel, is powered by a 4-cylinder engine delivering 35 brake hp at 2400 rpm. Mast gives max stacking height of 131¼ in., over-all lowered height of 83 in., and 16¼ in. of free lift. Over-all width is 32 in., outside turning radius is 62 in. (Dec 1, p152).

LIFT TRUCK—*Crown Controls Co, Inc, New Bremen, Ohio.* Model L-582 lift truck is powered by a 12-v battery, has a lifting height of 60 in. and a lifting capacity of 3000 lb. The 62-in.-long forks are laterally adjustable to provide a spread of 20 to 38 in. Other specifications include an over-all height of 82 in. and a width of 50 in. (Dec 1, p154).

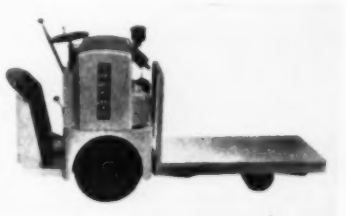
LIFT TRUCKS—*General Sales & Engineering Co, Dept AMN, 4525 N Clark St, Chicago 40, Ill.* Samson line includes both manually portable and mobile electric-powered models. Lift heights on standard units are from 6 to 63 in. Single or 3-phase motors may be specified for operation on 110, 220, or 400-v ac (Aug 11, p128).

ELECTRIC LIFT TRUCKS—*Yale & Towne Mfg Co, Yale Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Yale K410 trucks measure 108½ in. from rear of counterweight to face of fork carriage and 50½ in. in width across drive wheels. Turning radius is 92⅝ in. Available in capacities of 12,000 to 20,000 lb, trucks accommodate 60- and 72-v batteries. A 95-in.-over-all-height channel provides a max lift of 106¾ in. (Nov 3, p136).

PLATFORM TRUCK — *Prime-Mover Co, Muscatine, Iowa.* Model F-40, 4000-lb-capacity platform truck features a torque-converter drive transmission. Truck is powered by an 18-hp engine and features automotive-type steering. Area behind driver is 42 in. wide by 78 in. long. Space at right of driver is 21 in. wide by 122 in. long, and is designed for carrying long bar stock, pipe, lumber (Jul 14, p120).

PLATFORM TRUCK — *Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* Standard unit, added to Powrworker line of battery-powered hand trucks, will lift 4000 lbs. A 6000-lb-capacity machine is available. Max lifting height is 21 in. Skid-carrying platform is 26 in. wide and is furnished in lengths from 36 to 60 in. in 6-in. increments. Unit has a lift speed of 12 fpm loaded (Oct 20, p214).

LIFT TRUCKS—*Hyster Co, 2902 NE Clackamas St, Portland 8, Ore.* Space Saver line of lift trucks, available in 6000, 7000 and 8000-lb capacity models, is designed for operation under exacting space conditions. These cushioned-tire trucks feature short turning radius, power steering, a high torque engine and excellent visibility (Feb 24, p176).



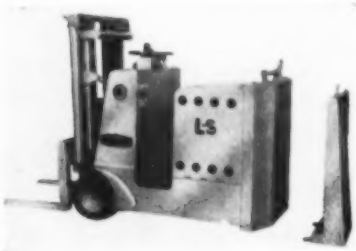
PLATFORM LIFT TRUCK — *Truck-Man Lift Trucks, 507 Liberty St, Jackson, Mich.* Model 75 platform lift truck features power steering, electric starter, and a No-Spin differential. Standard platform is 28 in. wide by 60 in. long, but larger platforms are available. Truck has a hydraulic power platform lift of 9 in. Lift is vertical for close placement of skids. Designed to handle skids or racks, truck has a capacity of 7500 lb (Sep 8, p132).

LIFT TRUCK—*Yale & Towne Mfg Co, Yale Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Available in capacities of 15,000 and 20,000 lb, these G-5 lift trucks feature 112- and 113-in. turning radii. Lifting speed is 50 fpm loaded; 60 fpm unloaded. Truck is powered by a V-8 motor using either gasoline or LP-gas (Nov 3, p132).

FORK TRUCK—*Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87 St, Chicago 20, Ill.* Transveyor Swing Reach truck has forks which reach out for the load and swing in unison, right or left of center up to 30°. Truck is available in 2000, 3000 and 4000-lb capacities. Truck has a maximum lift height of 130 in. from a collapsed mast height of 83 in. (Nov 17, p248).

SKID ADAPTER—*Yale & Towne Mfg Co, Automatic Transportation Co Div, 149 West 87 St, Chicago 20, Ill.* Adapter for company's Transporter line of operator-led low lift trucks enables trucks to handle either pallets or skids. Auxiliary platform can be folded back and held upright so that truck can handle pallets, or platform can be lowered over pallet forks to convert truck into a platform or skid handler (Aug 25, p115).

FORK TRUCK ATTACHMENT — *Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 West 87 St, Chicago 20, Ill.* Combination fork and boom is designed to handle bulky, non-palletized loads. Boom attachment extends 30 in. and has a capacity of 4800 lb; additional extensions are available. Attachment can be adapted to any of the company's high-lift fork trucks (Sep 8, p148).

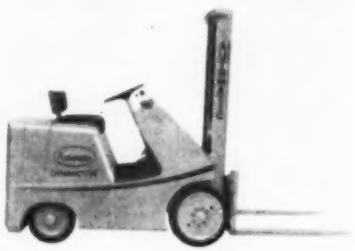


LIFT TRUCK—*Lewis-Shepard Products, Inc, 125 Walnut St, Watertown, Mass.* Model E electric fork lift truck has standard capacity of 2000 lb at a 48-in. load length. Stand for the counterweight, included as standard equipment, makes removal or replacement only a matter of loosening two bolts (Jun 30, p112).

FORK LIFT TRUCK—*Uhrden, Inc, Tubar Lift Div, Dennison, Ohio.* Designed to handle loads up to 1000 lb, the Champion Stroller, Model 777, has a lifting height of 60 in. Truck features include fluid drive transmission, dual lifting chains, 12-v electrical system, and a travel speed of 2 mph at capacity load. Truck has 24-in.-long forks and weighs 555 lb. It sells for $777 (Sep 8, p150).

PALLET TRUCK—*Raymond Corp, 47-161 Madison St, Greene, NY.* Hydraulic hand pallet truck added to line of narrow aisle equipment has same external design as the company's 2000-lb unit but incorporates stronger lifting mechanism, chains, and reach rods, plus reinforced frame. Carrying frame sizes range from 18 to 30 in. wide and 30 to 60 in. long. Model has 270° steering arc (Mar 24, p154).

WALKIE PLATFORM TRUCK—*Raymond Corp, 47-164 Madison Ave, Greene, NY.* The 24-v, 4000-lb capacity model for handling heavy skid loads has power unit only 24½ in. high and 20½ in. longer than load lengths. Design incorporates four 6-v batteries, two mounted on each side of the drive unit. Platform lengths up to 72 in. are available in widths 18, 24, or 30 in. (Aug 11, p146).



FORK LIFT TRUCKS — *Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87 St, Chicago 20, Ill.* Dynamotive fork lift trucks, gas-operated—electric-driven, are available in capacities of 4000 to 10,000 lb with lifting heights to suit all applications. Travel speed of 8.5 mph and a lifting speed of 75 fpm (with 4000-lb load) permit faster operation (Nov 3, p130).

ELECTRO - HYDRAULIC ELEVATORS—*West Bend Equipment Corp, 328 Water St, West Bend, Wis.* Line of lightweight, portable units for use in intermediate materials handling operations includes platform lifts, fork lifts, hinged, telescopic, and drum handling models. Called the Weld-Bilt Hy-Boy Verti-Lift, it is electro-hydraulically operated by a 12-v battery system. Standard model has a 64-in. lift, with solid platform, and lifting capacity up to 1500 lbs (Dec 1, p158).

DUMPING ATTACHMENT—*Yale & Towne Manufacturing Co, Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Rotating bin dumping attachment, 8000-lb capacity, for Yale lift trucks, can handle bins from 30 to 34 in. in width, 23 to 32 in. in height, and up to 48 in. long. Attachment rotates a full 360° in either direction (Jun 16, p170).

MAST—*Allis-Chalmers Mfg Co, Engine-Materials Handling Div, Milwaukee, Wis.* Lift truck mast, designated Tri-lift, is available for cushion- and pneumatic-tire lift trucks in the 3000 to 5000-lb classifications. Eleven basic sizes, including three standard sizes, are available. The three standard sizes provide total lifts of 144, 180, and 216 in. from masts with lowered heights of 71, 83 and 96 in., respectively (Jul 16, p138).

LIFT TRUCK CHANNELS—*Yale & Towne Manufacturing Co, Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Channels designed for a 10,000-lb capacity Yale gasoline-powered truck can raise a 4000-lb load to a height of 30 ft (over-all collapsed height is 200 in.). Lifting speeds of 20 fpm loaded and 21 fpm empty are possible (Jun 16, p150).

MAST—*Hustler Corp, 17871 Elm St, Willoughby, Ohio.* Lift truck mast for company's Pug electric lift truck extends to max height of 135½ in. Retracted height is 69 in. Mast has three telescoping sections (Jul 16, p146).

FORK-LIFT TRUCK MAST—*Truck-Man Trucks, 537 Liberty St, Jackson, Mich.* Tri-Free-Lift mast, now available on all Truck-Man models, combines higher lift with lower down height and a very high free lift. Available in three lifts, 136½, 145½, and 181½ in., masts have respective down heights of 68, 71, and 83 in. All three heights may be obtained with either 4000, 5000, or 6000-lb capacities (Feb 24, p178).

LOW-LIFT HAND TRUCKS — *Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87 St, Chicago 20, Ill.* These non-motorized trucks are available in a range of models including both mechanical and hydraulic lift styles, in either singe or multiple-stroke types, with capacities ranging from 1000 to 6000 lb. Pallet, platform and tin-plate types are available (Mar 10, p168).

DIE HANDLING TRUCK—*Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87th St, Chicago 20, Ill.* Model TLOH-20 incorporates both end and side loading. Winches are eliminated; hydraulic rams are used to pull dies (up to 40,000 lb) onto truck bed. Bed of platform is 27 in. from floor in low position and can be raised to 62 in. (Jun 2, p126).

POWER STEERING — *Towmotor Corp, 1226 E 152nd St, Cleveland 10, Ohio.* Improved hydraulic power steering is standard on Pace-Maker Model 670 and available as optional equipment on all Towmotor units of 5000-lb capacity and over. One-hand steering permits driver to operate gear shift and the lift and tilt levers on the move (Feb 10, p156).

SWEEPING TRUCK—*Patch & Kase Corp, 159 S Irwindale Ave, Azusa, Calif.* Task Master 42 with integrated drive, transmission, and steering assembly has a 5-ft 6-in. turning radius. Sweeping swath of the main broom is 42 in.; side broom, 70 in. Unit's speed is ½ to 15 mph; hopper capacity is 13.5 cu ft, ½ ton. Length is 85 in.; width, 52½ in.; height, 50¼ in. (Nov 17, p243).

LIFT TRUCK ACCESSORIES—*Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87th St, Chicago 20, Ill.* Elbolift electric lift truck (AM—Sept. 23 '57, p189) incorporates a side shifting fork and load carrying ram arrangement. Hydraulically controlled feature (optional) enables operator to side shift load 4 in. to either side of truck, or to bring forks together to form a load carrying ram (Jun 16, p155).

TRUCK TRANSMISSION — *Yale & Towne Mfg Co, Yale Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Fully automatic transmission is available for company's line of G-3 gasoline powered lift trucks (*AM*—Aug 26 '57, p162). This eliminates clutch pedal operation and constant manual gear shifting. Transmission is a combination of a torque converter and a planetary transmission (Feb 10, p185).

PORTABLE LIFT — *Crown Controls Co, Inc, New Bremen, Ohio.* Model L-642 can be fitted with attachments that permit it to do all kinds of lifting jobs. Each lift is shipped complete with following accessories: roller top table, smooth plate platform, adjustable forks, and a demountable boom. Lifting capacity is 2000 lb at a 15-in. load center on the roller top, smooth plate, and forks. The boom is rated at 500 lb (Nov 17, p278).

STACKING TRUCK — *Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* Battery-powered hand truck named Straddle Stacker is available in Model 20 STF (2000-lb capacity) and Model 40 STF (4000-lb). Unit can lift and tier palletized goods to a height of 94 to 140 in., depending on which of seven sizes of uprights are specified. Fork lengths available are 30, 36, 42, and 48 in. (Feb 10, p178).

CLAMP ATTACHMENT—*Lewis-Shepard Products, Inc, 125 Walnut St, Watertown 72, Mass.* Lift truck clamp attachment permits both palletized and non-palletized loads as well as those on skids and in bins, to be handled by any of the company's electric fork lift trucks. Attachment, which replaces the forks, is known as the Master Universal Clamp and has a clamping range of 18 to 46 in. or 23 to 60 in. (Oct 6, p141).

DIE-HANDLING TRUCK — *Elwell-Parker Electric Co, 4205 St Clair Ave, Cleveland 3, Ohio.* Model E12-20 SER can position dies on or off either side (as well as the end) of its platform, which permits stationing the vehicle parallel with press in narrow aisles. Truck is equipped with remote controls to permit operator to position dies while standing at either side of the truck, as well as in the normal driver's position (Nov 3, p143).

INDUSTRIAL CARTS—*SI Handling Systems, Division Safety Industries, Inc, PO Box 70, Easton, Penna.* Manual and dragline carts have load capacity of 600 lbs, deck size of 32 x 48 in., blackboard and tubular bill holder. Choice of wheel construction is available; tow pin for dragline carts has double cam that can be operated from either side of cart (Aug 25, p112).

FORK LIFT TRUCK—*Hustler Corp, 17871 Elm Rd, Willoughby, Ohio.* Hustler Brute features fast maintenance. All electrical contacts and hydraulic controls are mounted on the underside of the hinged truck top. This stand-up electric lift truck is furnished in 2000, 2500 and 3000-lb capacities at 24-in. load centers. Standard mast is 68 in. high with 33-in. free lift and a total lift height of 68 in. (Sep 22, p148).

CABLE REEL TRUCK—*Automatic Transportation Co, Div of Yale & Towne Mfg Co, 149 W 87th St, Chicago 20, Ill.* Model WC, with lifting capacities from 8000 to 15,000 lbs, incorporates pivoted lifting arms that are adjustable. Eight-inch load arms are available to handle reels 36 to 46 in. in width and 30 up to 90 in. in dia. Max lift raises the 90-in. reel 3 in. off floor surface (Jun 2, p119).

DIE HANDLING TRUCK — *Clark Equipment Co, Industrial Truck Div, Battle Creek, Mich.* High lifting platform truck, the Powrworker die handler, will lift stamping dies weighing up to 4000 lbs and tier them in storage. Dies are pulled on or pushed off the platform with a T-shaped hook driven by a hydraulically powered worm screw. Platform is 26 in. wide and is available in lengths of 36 to 60 in. (Nov. 17, p256).

VIBRATORY CONVEYOR—*Link-Belt Co, Dept PR, Prudential Plaza, Chicago 1, Ill.* Unit can be mounted directly under a hopper or bin to feed, convey, or scalp bulk materials. A geared eccentric shaft mechanism produces a straight-line stroke that ranges from ¼ to ⅜ in. at 900 rpm. Models are available with trough lengths up to 12 ft and trough widths up to 6 ft (Aug 11, p126).

OVERHEAD CURVES — *Chainveyor Corp, 5618 E Washington Blvd, Los Angeles 22, Calif.* Extremely tight horizontal curves, 6, 9 and 12-in. radius, have been developed for systems where it is advantageous to return a line on short radius, and are particularly suited for use in ovens, drying areas and storage lines (Aug 11, p146).

STEEL CONVEYOR BELT — *Prab Conveyors, Inc, 30121 Groesbeck Hwy, Roseville, Mich.* Heavy-duty steel belt for handling press scrap, turnings, chips, parts, assembly, is furnished in conjunction with Prab's side sections to form an enclosed, self-supporting conveyor elevator. Belt has 6-in. pitch (Jul 28, p116).

CONVEYOR—*Conveyor Specialty Co, Inc, North Quincy, Mass.* Gravity wheel conveyors using ball-bearing wheels are low in cost, light in weight. Straight sections come in 5- and 10-ft lengths, and 12-, 15-, 18- and 24-in. widths. Curved sections come in 33- and 15-in. inside radius, 90° and 45° angles, and 12-, 15-, 18- and 24-in. widths. Line of accessories available (Dec 15, p145).

MAGNETIC CONVEYOR — *M-H Standard Corp, 515 Communipaw Ave, Jersey City 4, NJ.* Magnabelt magnetically moves nails, bolts, stampings, and other ferrous parts up inclines as high as 90°. Unit is adjustable from 60° to 90°. Belt is 6-in.-wide neoprene, runs at 85 fpm. Standard portable models are available from 4 to 10 ft high in one-foot increments (Sep 22, p146).

VIBRATORY CONVEYOR — *Eriez Manufacturing Co, Erie 6, Penna.* Model V3B-40A added to Hi-Vi line is equipped with electro-permanent magnetic drive that is plugged in to standard ac line. Unit processes wide range of material densities—from 40 to 150 lbs per cu ft. Base is designed to allow the feeders to be mounted side by side, back to back, or in tandem (Aug 11, p122).

FLEXIBLE CONVEYOR—*Jervis B Webb Co, 8951 Alpine Ave, Detroit 4, Mich.* Pushbutton-controlled, electrically powered Flex-Bend bends horizontally in either direction to carry materials mechanically around stationary objects. Standard unit components include power stacker car, belt drive car, power traveler car, and any number of center cars required (May 19, p160).

LIVE ROLLER CONVEYOR — *Sage Equipment Co, Buffalo, NY.* Conveyor is actuated by special heavy-duty V-belt, is made with straight face or tapered rollers in various diameters and lengths of roller to suit application. Standard 4 ft 6 in. and 6 ft 0 in. radius units are manufactured; 45°, 90°, and 180° curves are available (Oct 6, p130).

CONVEYOR SYSTEM — *Dearborn Fabricating & Engineering Co, 19440 Glendale Ave, Detroit 23, Mich.* Cable-Link conveyor incorporates links of preformed wire rope in multiples of 8 in. Trolleys, turns and vertical dip wheels can be combined to offer max movement in either vertical or horizontal direction. Units are standard in 8, 16, 24-in. lengths (Jul 14, p142).

WORK BENCH—*Lyon Metal Products, Inc, Aurora, Ill.* 48-in. work bench is 34 in. high, is made in 28 and 34-in. depths, and is available with plain steel, tempered pressed wood over steel, or laminated hardwood top. Standard accessories include shelf, riser, electrical outlet strip, back and end stops, channel stringer, and bench drawers (Oct 6, p141).

STEEL COUNTERS—*Penco Metal Products Div, Alan Wood Steel Co, 200 Brower Ave, Oaks, Penna.* Heavy-duty steel service counters are available with or without doors; reinforcements can be added where loading is extremely heavy. Dividers and drawers can be added to the under-counter storage bins. Any number of sections can be bolted together. They are available in a wide range of sizes with standard height of 39 in. (Sep 22, p158).

WORKTABLES — *Johnson Products, Inc, PO Box 424, Wilton, Conn.* Swaptops provide quicker initial setup and easier product changeover. The steel frames offer firm support for the interchangeable, quick-release work tops. Latch-on leg assemblies, a variable back service panel and optional shelves, skirts, wiring, etc, add to versatility. Standard size frames are 48, 60 and 72 in. long, and 24 and 30 in. deep (Dec 1, p142).

ADJUSTABLE RACK — *Midland Equipment Div, 485 South 21st St, Irvington, NJ.* Utilizing a positive wedge-locking principle, the FICO storage rack can be assembled rapidly to provide storage space for pallets, skids, barrels and many other products. Rack is assembled from two parts, a complete all-welded upright frame and a stringer which hooks into the rack (Nov 3, p144).

DRY MATERIAL FEEDER—*Hartley Controls Corp, Neenah, Wis.* A storage hopper large enough to store a day's supply of metal powder, or any other dry, powdered material, is one of the outstanding features of the Bond Feeder. From this hopper, material is transported to the mixer where it is accurately measured in individual batches as desired. These batches can be varied by a simple setting of the control (Jul 14, p138).

ADJUSTABLE STORAGE RACK — *American Metal Products Co, 5959 Lansdale, Detroit 4, Mich.* Model SL-2 accommodates three types of stringers—light, medium, and heavy-duty—that raise and lower like a window in the slotted post. All stringers are made of continuous welded tubing to the same cross-section OD's; only the thickness of the steel varies to carry different capacities. No bolting or welding is required (Aug 11, p143).

TROLLEY HOIST — *American Engineering Co, Wheatsheaf Lane & Septima St, Philadelphia 37, Penna.* Four-wheel motor-driven trolley hoist has lower price; and headroom, end approach, and side clearance dimensions lower than previously possible. Trolley is offered on all Class A, B, H, and J Lo-Hed single-speed, two-speed or variable-speed hoists that have lifting capacities ranging from one to 15 tons (Nov 3, p138).

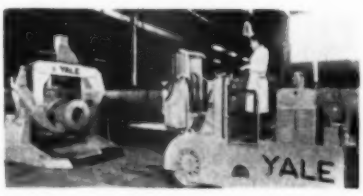
CABINET WORK BENCHES—*Equipto, Div of Aurora Equipment Co, Aurora, Ill.* Work benches are available in 104 different models. They feature closed ends and backs, with doors, drawers and shelves as desired. Benches are available with 12-gage-steel, masonite-on-steel, maple or plastic bonded tops. Four, five and six foot lengths are available (Apr 21, p246).

REVOLVING BIN — *Supreme Steel Equipment Corp, 3rd St & First Ave, Brooklyn, NY.* Revolving bin is 34 in. in dia, 65½ in. high, has seven revolving disks. Features include boltless removable bin fronts, boltless adjustable dividers, centering guide to keep drawers in place, and slotted hub cylinder (Oct 20, p236).

LIFT TABLES—*Clark-Aiken Co, Lee, Mass.* Lift tables are available in three sizes—48 x 24, 52 x 30, and 72 x 42 in. They are designed to lift 2000, 4000, and 6000 lb to heights of 30, 36 and 48 in., respectively, in less than 30 sec. Unit folds to a height of 7 in. Table top is one-piece heavy steel plate. Power is furnished by motor through a heavy-duty hydraulic cylinder (Jun 16, p147).

TOOL AND GAGE CABINET—*M & S Equipment Co, 880 Darwin Drive, Snyder 26, NY.* Cabinet, occupying only 2.9 sq ft of floor space, provides up to 70 sq ft of storage area. Individual tool compartments with masonite sides and oil-resistant liners assure protection against chipping or nicking of items and provide dustfree storage. Three models are available, all mounted on casters (Mar 10, p196).

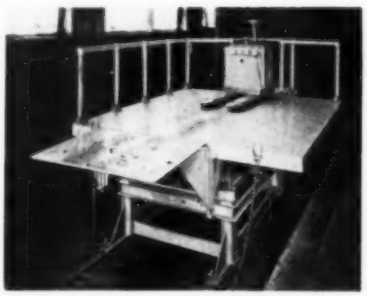
TOOL CHESTS—*Hunter Tool, Box 564, Whittier, Calif.* Mechanics' tool chests, made of heavy-gage steel, feature many combinations of chests and roller cabinets, plus the company's Theft-proof one-piece locking system (Nov 7, p267).



METAL COIL HANDLER — *Yale & Towne Mfg Co, Yale Materials Handling Div, 11,000 Roosevelt Blvd, Philadelphia 15, Penna.* Floor-mounted rotating device positions metal coils for easier pick-up by fork- and ram-type lift trucks. Device automatically upends coils received in palletized form, and positions them for truck pick-up. Reversing operation permits unit to palletize coils (Dec 29, p75).

JIB CRANE *Borg-Warner Industrial Cranes, 1536 S Paulina, Chicago 8, Ill.* Jib Master is designed to meet need of average industrial plant. It is self-supported and can be rotated through 360° to provide hook coverage over a large floor area. Crane is designed for use with either a chain block or an electrical hoist. Jib Master is available in capacities to six tons, boom lengths to 20 ft (Sep 22, p160).

MECHANICS' TOOL CHESTS—*L S Starrett Co, Athol, Mass.* Chests are available in reinforced steel (Model 200M, $31.25) and hand-rubbed mahogany (Model 200W, $38.00). When furnished complete with tools, prices range from $78.65 for an economy assortment of 11 tools in metal chest to $207.15 for an advanced kit of 21 tools in the wood chest (Oct 20, p195).



PORTABLE ELEVATOR — *Hamilton Tool Co, Ninth St at Hanover, Hamilton, Ohio.* Portelevator is used as a variable-height loading dock. It maintains constant level with truck beds, eliminating the usual ramp. Another outstanding feature is that the unit can be positioned by overhead crane. Platform is 10 x 12 ft. Load capacity is 10 tons, lift is 22½ in. (from 36½ min to 59 max); lift speed is 13 ipm (Apr 7, p137).

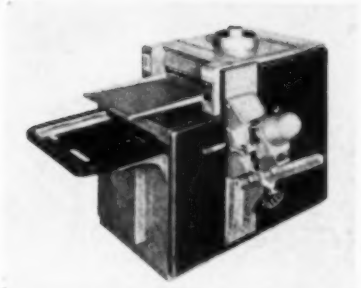
WORK BENCH—*Challenge Machinery Co, Grand Haven, Mich.* Heavy-duty work bench, for machinists and toolmakers, has a 1½-in.-thick cast iron top. Unit is said to be low in cost (Apr 21, p279).

CHAIN HOIST—*Thor Power Tool Co, Prudential Plaza, Chicago 1, Ill.* Air-operated chain hoist, 1000-lb capacity, weighs only 30 lb and raises half-ton loads at a rate of 50 fpm. Designated Model H-1000, the hoist is powered by a reversible 8-blade air motor, and is capable of lowering rates up to 96 fpm. Sensitive throttle control permits accurate positioning (Jun 16, p147).

PANS — *National Vulcanized Fibre Co, 1058 Beech St, Wilmington 99, Del.* Pans for handling small parts are made of 0.050-in. thick vulcanized fiber, rivet-constructed. Kennett line is available in five sizes from 2¾ to 3½ in. deep (May 19, p163).

CRANES—*Manning, Maxwell & Moore, Inc, Shaw-Box Crane & Hoist Div, Muskegon, Mich.* Heavy industrial cranes, known as the Shaw-Box SC line, are available in spans up to 120 ft, capacities through 25 tons, and come equipped for floor or cage operation. Although cranes are built to meet exact requirements, all components are standardized so as to be interchangeable. Bulletin available (Sep 22, p148).

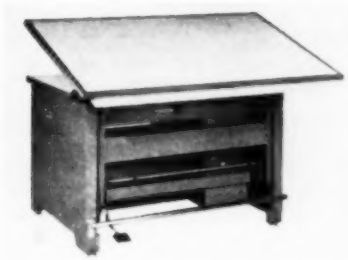
CRANE — *Mechanical Refrigeration Enterprises, PO Box 122, North Hollywood, Calif.* Crane, designated Mr. Hercules, weighs under 20 lb, lifts over 125 lb to height of 7 ft. Boom is adjustable vertically; unit is equipped with heavy-duty rubber wheels (Feb 10, p174).



REPRODUCING MACHINE—*Charles Bruning Co, Inc, 1800 West Central Rd, Mt Prospect, Ill.* Copytron Model 1000 Enlarger-Printer is designed for enlarging and reproducing records which have been reduced to 35-mm microfilm size. The machine enlarges the microfilm 14 to 16 times and prints black-on-white enlargements on sheets ranging from 8½ x 11 in. to 8 x 24 in. Cost is only a few cents per print. An electrostatic printing principle is used (Oct 20, p212).

PENCIL POINT DUSTER — *Walker Mfg Co, Box 6471, San Diego 6, Calif.* Device removes graphite particles from point, preventing smudges and smears. Point is inserted in the slot provided in the plastic diaphragm and is then rotated to remove particles. Device is easily attached to drawing board. Price is 95¢ (Aug 11, p146).

WHITEPRINT MACHINE — *General Aniline and Film Corp, Ozalid Div, Johnson City, NY.* Printmaster 1000 accommodates materials up to 54 in. wide by any length. It will print and develop at speeds up to 100 fpm. Machine is 66 in. high, 78 in. wide, 55 in. deep including feed board, 35 in. without feed board (Apr 21, p279).



DRAFTING TABLE—*Mayline Co, Inc, Sheboygan, Wis.* May-O-Matic drafting table, now available with either a wooden or a linoleum-covered steel top, provides instant top tilt and table height adjustments. Top board sizes range from 37½ x 48 to 42 x 84 in. Also available is new 4-post steel base drafting table (Apr 21, p182).

MACHINE CONSTRUCTION KITS—*FAC Division, 9551 Grand River Ave, Detroit 4, Mich.* These Swedish-made kits are designed to serve as engineering tools to enable engineers, designers, automation specialists and inventors to make precision working models of practically any type of machine, drive or mechanism (Apr 21, p260).

DRAFTING TRIANGLE—*Alvin & Co, Inc, Windsor, Conn.* "Triple-Angle" triangle utilizes the functions of three triangles. Features include 45/90° and and 30/60° angles, and built-in slot lettering guides for ⅛, ¼ 3/16, and ⅜-in. lettering (Jun 16, p156).

TOOL CLAMP TEMPLETS—*Pic Design Corp, 477 Atlantic Ave, East Rockaway, LI, NY.* Plastic tool clamp templets are available free upon request. The set of three templets combined contain over 30 different figures (Jun 2, p136).

ELECTRONIC DUST PRECIPITATOR—*American Air Filter Co, 215 Central Ave, Louisville 8, Ky.* Electro-cell dust precipitator operates with face velocities of up to 600 fpm. Individual cells contain positive and negative collector plates fixed in position. The all-aluminum collector cells are available in heights of 16 and 20 in. and widths of 24 and 36 in. Cell capacity ranges from 800 to 2750 cfm (Jul 14, p122).

DUST COLLECTORS—*Hammond Machinery Builders, Inc, 1618 Douglas Ave, Kalamazoo, Mich.* Junior Cyclone DusKolectors are available in two capacities, 400 and 600 cfm, and operate on the same principle as the larger models. Units are 53 in. high. The 400-cfm model has a ½-hp motor; the 600-cfm model, a 1-hp motor (Mar 10, p170).

PORTABLE DUST COLLECTOR — *Cincinnati Fan & Ventilator Co, 3548 Montgomery Rd, Cincinnati 7, Ohio.* Self-contained Dust-Master Model 100 fits any 55-gal open-end steel drum. Unit is cyclone separator type. Heavy dust is precipitated to the bottom and out of the air stream by centrifugal action; very fine dust particles are discharged through exhaust outlet into after-filter bag, or may be piped outside building (Nov 17, p250).

SHOE BRUSHING UNIT — *Liberty Machine Co, 297 Seymour Rd, Berlin, Conn.* The Shoe Brusher is designed for industrial applications calling for dust-free rooms, absence of bacteria, radiation detection, recovery of precious metals, or the maximum in cleanliness. Unit is equipped with a vacuum cleaner, and is available in either a foot-actuated or electric-motor-driven model (Oct 6, p146).

DUST COLLECTORS—*Torit Mfg Co, 287 Walnut St, St Paul, Minn.* Line of cyclone separator dust collectors has been converted to radial fans. Change increases performance because radial wheels move greater volumes of air and operate efficiently against higher resistances. Model 13 (¾ hp) moves from 311 to 540 cmf; Model 18 (1½ hp), 456 to 825 cfm; Model 19 (2 hp), 860 to 1200 cfm; Model 219 (5 hp), 1598 to 2125 cfm (Jul 28, p114).

AIR COMPRESSORS — *DeVilbiss Co, Toledo 1, Ohio.* Compressors for use in spray painting and for operation of air tools are available in two new sizes, 20 and 25 hp, 125- and 175-lb models. These units displace from 96.4 to 129 ft of air per minute. The V-type multiple-cylinder compressors have a bore in the first stage of 4½ in. and 2½ in. in the second stage. Length is 88 in., height 28⅜ in., width 28 in. (Oct 20, p238).

AIR SERVICE PACKAGE—*Weatherhead Co, Fort Wayne Div, 128 W Washington Blvd, Fort Wayne, Ind.* Package includes blow gun with variety of nozzle attachments; quick-disconnect ends with check units and adapters with nipple attachments for any size and type; Barb-Tite hose ends available in size range from ¼ through ¾ in. in eight styles; hose with pressure recommendations to 250 psi (Oct 6, p134).

AIR BLOW GUN—*Perfecting Service Co, 332 Atando Ave, Charlotte, NC.* Air blow gun releases any volume of flow required by slight pressure on the trigger. Ten-inch extension nozzle is available in both straight and curved design (Nov 3, p138).

PORTABLE VACUUM CLEANER — *U S Hoffman Machinery Corp, Air Appliance Div, 103 Fourth Ave, New York 3, NY.* The Wetco-Vac portable vacuum cleaner is designed for general plant cleanup work but has proved especially valuable in the safe removal of magnesium grinding dust. The dust is picked up and conveyed to the machine's wet-type separator section. The vacuum cleaning unit is 74 in. long, 83½ in. high and 39 in. wide (Dec 1, p138).

DRUM VACUUM CLEANER—*Black & Decker Mfg Co, Towson 4, Md.* Heavy-duty unit uses any standard 55-gal metal drum for top-capacity vacuum cleaning or material recovery (Oct 20, p198).

LAMP—*Faries Lamp Division, Elwood, Ind.* Incandescent lamp, designated Kold, has adjustable flexible arm. Unit extends from a minimum of 12-in. to a max of 38 in. Outside shade remains cold to the touch even after continuous burning of a 75-w bulb. Eight types in both fluorescent and incandescent models are available (Jun 16, p156).

TELEPHONE BOOTH—*Suttle Equipment Co, 135 S La Salle St, Chicago 3, Ill.* Wall-mounted open telephone booth, designed for noisy plant locations, is made from heavy-gage steel with a perforated steel interior covering sound absorbing material built into the walls and top. Booth is 28 in. wide by 30 in. high, and is 23 in. deep at the top, tapering to 15 in. at writing shelf (Oct 6, p141).

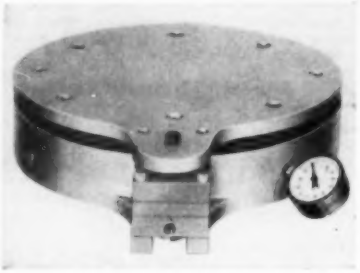
SAFETY GLASSES—*American Optical Co, Southbridge, Mass.* Glasses incorporate an eye-wire with specially developed groove that not only holds lens securely, but supports it against it being driven backward toward eye when struck. Deeper lens groove gives maximum support of entire periphery; if lens should be broken by unusually severe impact, fragments are held together (Jun 2, p136).

GOGGLES—*Bausch & Lomb Optical Co, Rochester 2, NY.* Cup-type safety goggles, available in eight new models, are injection molded from tough thermo-plastic, have high impact resistance, and are designed for heavy industrial application. Two models have replaceable sponge face pad. Four chipper-type goggles have heat-treated lenses and perforated side shields. Welding goggles feature dark green glass (Nov 17, p267).

FIRE EXTINGUISHERS—*Pyrene-C-O-Two Division, Fyr-Fyter Co, Box 750, Newark 1, NJ.* Units with dry chemical powder for Class B and Class C fires are available in 20 and 30-lb pressurized heavy-duty models. A 15-20-ft stream of the powder can be delivered over a 60° arc (Jun 16, p155).

SAFETY MATS—*American Mat Corp, Toledo, Ohio.* Latest additions to the company's line of safety mats include Royal Guardsman colored vinyl plastic link mat for entrances; Plastilon plastic runner; Traffic King plastic matting for shower rooms and stalls; Shadowtone grease-proof runner matting (Oct 20, p202).

INDUSTRIAL KNIVES—*X-acto, Inc, 48-41 Van Dam St, Long Island City 1, NY.* Industrial cutting knives, trade-named Safety-Guard, are constructed of heavy-duty machined aluminum and have a knurled, easy-to-grip sliding sleeve which may be locked at any position on the knife barrel. Sleeve can be positioned to expose only as much of the blade as is necessary. The sleeve also acts as a depth gage (Nov 17, p260).



MACHINE SUPPORTS — *Weber Instrument Co, 11301 Schaefer Rd, Detroit 27, Mich.* Basically an air container of nylon-reinforced neoprene and cast aluminum, fitted with pressure indicating gage, the Air-Mount is placed under each support point of a machine and connected to the shop air supply (100 psi). Units are designed to support and indicate loads from 5000 to 12,000 lb each with a 100-psi air supply (Feb 10, p165).

WIRE BRUSHES — *Anderson Corp, 1029-1039 Southbridge St, Worcester, Mass.* Phosphor-bronze wire brushes, for applications where sparks may be dangerous or undesirable, are available as standard in 4- and 6-in. cup types, medium and wide-face wheel type, and both straight and bend-handle scratch type. Special styles can be supplied to suit individual requirements (Dec 1, p160).

SOCKET HOLE CLEANERS—*Scully-Jones and Co, 1901 S Rockwell St, Chicago 8, Ill.* Tools clean dirt and foreign matter from machine tool spindle sockets. Tapered models are available for Morse taper holes 1 through 6, for Nos. 30, 40 and 50 NMTBA taper holes, for Nos. 6, 7 and 10 Jarno taper holes, as well as for Nos. 7, 9, 10, 11 and 12 B&S taper holes. Tools for cleaning straight holes are available in diameters of $\frac{5}{8}$ through $1\frac{7}{8}$ in. (Nov 17, p264).

TAPE-WINDER—*Universal Mfg Co, Inc, 410 Hillside Ave, Hillside, NJ.* Portoroyd tape winder is recommended for taping cables, wire harnesses, bus bars and pipes. It is made in three models—PT-6, PT-9, and PT-12. The PT-9 and PT-12 require no storage magazine. Model PT-6 requires a storage magazine, and can handle tapes up to $\frac{3}{4}$ in. wide (Apr 21, 187).

MACHINE CLEANER—*Anderson Oil and Chemical Co, Inc, Portland, Conn.* Winsor No. 607 removes all gummy deposits on working surfaces of machines and removes all deposits and sludge from the inside surfaces of coolant lines and fittings. This concentrated liquid cleaner is germicidal, yet practically odorless (Apr 21, p285).

THREAD COMPOUND—*Crane Co, 836 S Michigan Ave, Chicago 5, Ill.* Anti-seize thread compound for high-temperature service retains its homogenized consistency indefinitely, is non-settling, non-skinning, and non-hardening in the can. Effective at temperatures to 1050 F, material is highly adhesive. Available in 1-lb and 4-lb cans (Dec 15, p145).

PLASTIC WALL PANEL—*Haskelite Mfg Corp, Grand Rapids 2, Mich.* Plastic wall panels speed plant expansion or revision. Tongue-and-groove locking panels are fastened over steel framework. Panels are $2\frac{1}{4}$-in. sandwich construction. Core is polystyrene foam, and the facings are of glass-fiber cloth reinforced with polyester resin over $\frac{1}{4}$-in. cement asbestos board (May 19, p147).

MACHINERY LEVELING MOUNT—*Clark-Cutler-McDermott Co, Franklin, Mass.* Wedgmount, for use under machines weighing up to 50,000 lbs, operates on a sliding wedge principle to raise or lower machines. Unit measures 8 x 8 in. and is usually placed under corners of heavy duty equipment. Air-Loc material of vinyl, sisal, and cork on top and bottom of the mount prevents lateral movement of machines (Sep 22, p144).

ALLEN WRENCH HOLDER — *Contour Marker Corp, 1843 E Compton Blvd, Compton, Calif.* Device, Co-Ma-Co, holds 10 or more units of various sizes. Aluminum carrier weighs $\frac{1}{2}$ oz, is priced at $1.50 (Aug 11, p143).

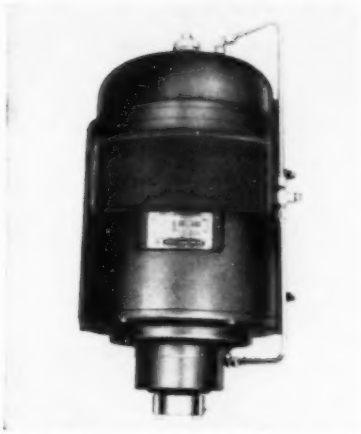
MASKING TAPE — *Permacel, New Brunswick, NJ.* Permacel EM 3877 Super High Temperature Crepe is said to be capable of withstanding temperatures up to 425 F, even when baked for several hour-long cycles. Product is recommended for use on specially treated metal surfaces such as anodized or alodized aluminum and dichromated magnesium (Oct 20, p222).

BRUSH—*Siline & Johnson, Wapello, Iowa.* Nylon brush, designed especially for machine cleaning jobs, is reported to outlast other brushes by 7 to 10 times. Brush is unaffected by alkalis, detergents, oils and greases, even dilute acids. Over-all length is $11\frac{1}{2}$ in.; bristle length is $2\frac{1}{8}$ or $2\frac{1}{4}$ in., bristle width is $1\frac{1}{4}$, $1\frac{1}{2}$ or 2 in. Prices range from $1.70 to $2.00 (Jul 14, p134).

WIPING CLOTH — *Textile Products, 181-189 Chestnut St, Newark 1, NJ.* Wiping cloth, trade-named Tex-Pro Kwik Wipe, a non-woven, lint-free product made of cotton fibers, can absorb 9 to 10 times its weight in water, 7 to 8 times its weight in oil. It is furnished uniformly cut, 100 per bundle and 60 wipers to the pound (Feb 10, p186).

American Machinist 1959 PRODUCTION PREVIEW

PARTS AND MATERIALS



VARIABLE SPEED MOTOR—*Allis-Chalmers Mfg Co, Milwaukee 1, Wis.* Designed for machine tool application, this water-cooled, shell-type dc spindle motor has infinite speed variation from 50 to 6000 rpm. Motor delivers constant torque from 50 to 1500 rpm and constant horsepower from 1500 to 6000 rpm. Outside diameter is 13½ in.; overall length is 28 in. (Feb 10, p151).

STATIC DC POWER SUPPLIES—*General Electric Co, Schenectady 5, NY.* Packaged static dc power supplies for motor drives are now available in ratings up to 300 kw. Units may be used in place of the motor-generator sets normally used in processing lines and similar applications where nonreversing adjustable speed drives without pump-back are required (Oct 6, p130).

ADJUSTABLE SPEED DRIVES—*Cutler-Hammer Inc, Milwaukee 1, Wis.* Ultraflex adjustable-speed dc packaged drives feature static power conversion units in place of conventional motor-genertor sets. This makes possible savings of up to 50% or more in floor space, and up to 75% in weight. Drives are available in sizes from 1 hp to 200 hp and in two styles—Ultraflex E, utilizing electronic tubes for power conversion, and Ultraflex M, utilizing magnetic amplifiers (Sep 22, p150).

MACHINE TOOL MOTORS — *Allis-Chalmers Mfg Co, Milwaukee 1, Wis.* Super-Seal motors with epoxy-encapsulated stator windings simplify machine tool specifications by allowing the use of an open motor in many applications usually calling for some sort of protected motor. These motors can carry (continuously) a 15% horsepower overload. Service factor often allows use of a smaller motor (Dec 1, p156).

MACHINE DRIVES—*Lima Electric Motor Co, Inc, Lima, Ohio.* Gearshift drives are available in a wide range of styles and gear ratios for vertical mounting. Units are used with geared devices or V-belts and sheaves to step-up or reduce the output speeds on drilling and tapping machines, materials handling equipment, etc. Horsepower ratings range from ½ to 10 hp (Nov 17, p270).

ELECTRIC MOTORS—*Reliance Electric & Engineering Co, 24701 Euclid Ave, Cleveland 17, Ohio.* Submersible ac electric motors for direct coupling to pumps that must operate while submerged in oil, water, or liquid chemicals, are available as polyphase, single-voltage units in sizes from ¾ through 15 hp. They are rated at 55-C temperature rise for 30 minutes duty in 40-C air, and for continuous duty in 40-C liquid (Jul 14, p134).

REMOTE SPEED CONTROL—*Gerbing Mfg Corp, 11800 Milwaukee Ave, Northbrook, Ill.* Speed of variable speed drives can be regulated by electric remote-control adjustable motor base. Unit is designed for use where variable speed motor pulley drive is located in an inaccessible spot or where speed changes must be made or controlled from remote points. Unit consists of FHP motor, gear reducer, chain drive, and overload protection clutch (Feb 10, p158).

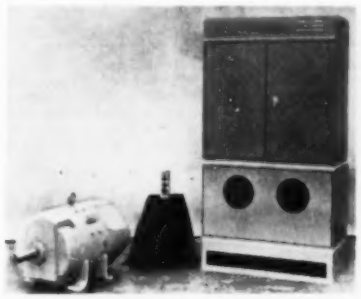
MACHINE TOOL MOTORS—*Reuland Electric Co, Alhambra, Calif.* Heavy-duty machine tool motors feature a fin-type design which, in conjunction with a cast aluminum alloy frame, provides a heat dissipation ratio three times as efficient as cast iron. Motors are available in ratings from ½ through 10 hp in totally enclosed fan-cooled and non-ventilated types, for continuous or intermittent duty (Sep 22, p164).

MOTORS—*General Electric Co, Schenectady 5, NY.* Wound rotor motors, Tri-Clad 55, are available from 5 through 150 hp. Type MR is intermittent rated for crane and hoist operation. Type M, rated for constant or adjustable speed, is designed for applications on industrial equipment such as fans, compressors, and pumps (Sep 8, p152).

VERTICAL MOTORS—*Reliance Electric & Engineering Co, 24701 Euclid Ave, Cleveland 17, Ohio.* Motors are furnished in sizes from one to 40 hp for direct mounting on high-thrust pumps, and are available in all standard enclosures, and all standard speeds up to 3600 rpm. Bonnet design of the splash cover permits stacking of additional bearings to absorb up-and-down thrust (Jun 30, p120).

VARIABLE SPEED DRIVE—*Sterling Electric Motors, Inc, 5401 Telegraph Rd, Los Angeles 22, Calif.* Speed-Trol variable speed drive integrally combined with a right angle gear reducer is available in drip-proof and totally-enclosed models in speeds from 360 to 5.5 rpm and speed variations from 2:1 to 10:1 (Jun 30, p118).

DC MOTORS—*Allis-Chalmers Mfg Co, Milwaukee 1, Wis.* Available in constant or adjustable speed in frame sizes of EB-120 and up, in ratings from 10 through 200 hp, these motors are designed for machine tool drives, steel mill drives as well as other heavy applications in locations having airborne foreign matter. Motors feature self-contained heat exchanger cooling (Jun 2, p120).



ADJUSTABLE SPEED DRIVE—*General Electric Co, Schenectady 5, NY.* PAR-matic drive, featuring power amplistat regulation, is suited for a variety of industrial applications—ranging from machine tools to pumps and conveyors. Available in ratings of 10 to 200 hp, unit operates from standard 440-v, three-phase, 60-cycle power. Packaged unit consists of amplistat controller, dc drive motor, and remote control station (Nov 3, p140).

ADJUSTABLE SPEED DRIVE—*Louis Allis Co, Dept P, 427 E Stewart St, Milwaukee 1, Wis.* Allispede Drive offers infinitely adjustable speed range up to 8:1 with output speeds of 1 to 10,000 rpm. The drive, wihch operates from an ac power source, is available in ratings from 1 to 20 hp (Nov 3, p134).

AC MOTORS—*Reliance Electric & Engineering Co, 24701 Euclid Ave, Cleveland 10, Ohio.* Line of ac motors in new, large NEMA frame 364U through 445U can be supplied in NEMA electric design B, C, and D. Line of large-frame motors may be specified in many speeds, and with Class A, Class B, or high-temp Class H insulation (Feb 10, p180).

FREQUENCY CONVERTER—*Georator Corp, Manassas, Va.* This 60- to 300-cps frequency converter provides power for high-frequency power tools, grinder spindles, and electronic circuits. Input is 208/416 volts, 3-phase, 60 cycles; output is 360 cycles, 230 volts, 3-phase, 5 kva. Unit measures 18½ x 13 x 13 in. and weighs 210 lb (Mar 10, p184).

GEARMOTORS—*Lima Electric Motor Co, Dept 132, Lima, Ohio.* Line consists of single, double, and triple reduction units, integrally motor mounted, with Duti-rated lifetime gearing. Motor capacities are rated from 1 to 125 hp, with output reduction speeds from 780 to 7½ rpm. Standard electrical characteristics are normal torque, 3 or 2 phase, 60 c, 208, 220/440, or 550v (Dec 1, p158).

PUMP MOTORS — *Reuland Electric Co, Alhambra, Calif.* Hydraulic pump motors, in heavy-duty frame sizes 364U and 365U, have been added to line of spline-coupled hydraulic pump mount motors. These latest additions extend the line to cover sizes from ½ through 50 hp. No mechanical couplings are needed; alignment is automatic. Motors are supplied for either single- or double-end pump installations (Nov 17, p260).

CLUTCH-BRAKE COMBINATIONS—*Stearns Electric Corp, 120 N Broadway, Milwaukee 2, Wis.* Series designated Style SMCB is available is sizes 2, 3, and 5. Both clutch and brake are magnetically set, including a neutral position. Torque ranges of these units run from 25 in.-oz to 175 in.-lb on both clutches and brakes. Both clutch and brake coils are set up for dc operation and can be wound for any voltage up to and including 90-v dc (Oct 20, p210).

CLUTCHES AND BRAKES—*Pic Design Corp, 477 Atlantic Ave, East Rockaway, LI, NY.* Magnetic clutches and brakes are available from stock in two diameter series: 1 1/16-in. dia, size 11 frame; and 1¾-in. dia, size 18 frame. Torque range is from 8 oz-in. to 40-oz in.; speeds up to 5000 rpm. Catalog 15 lists five different sizes (Jun 16, p166).

DRIVE CONTROL—*Graham Transmissions Inc, Menomonee Falls, Wis.* Precision control for infinitely-variable-speed drives is designed for panel mounting at the remote station. It permits setting of the company's drive units to one part in 4000. Unit is available with standard lengths of cable from 1 to 6 ft. Control can be used with any of the company's drives in sizes from 1/12 to 3 hp (Mar 24, p172).

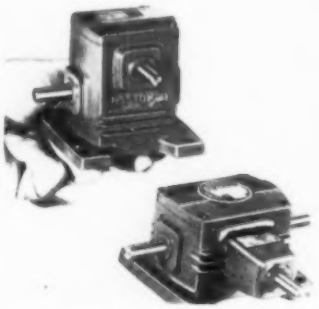
GEARMOTORS—*Western Gear Corp, PO Box 182, Lynwood, Calif.* Straight-line gearmotors, both integral and all-motor, are available in ranges from 1 to 60 hp, from 8 to 520 rpm. Features detailed in bulletin 5806 requested on company letterhead (Feb 24, p151).

SPEED REDUCERS — *D O James Gear Mfg Co, 1140 W Monroe St, Chicago 7, Ill.* Type RS features right angle drive, and is available in 13 sizes from 1/3 to 30 hp, with output speeds of 11.5 to 310 rpm. Type MS features inline drive, and is available in 37 sizes from 1 to 75 hp, with output speeds of 1.5 to 190 rpm (Feb 10, p478).

GEAR REDUCERS—*Lovejoy Flexible Coupling Co, 4966 W Lake St, Chicago 44, Ill.* Shaft-mounted reducers come in 18 models, including single and double reduction types. Single reduction types are 98% efficient and afford 4.5:1 speed ratio (nominal). Double types are 96% efficient, afford 14.7:1 speed ratio (nominal). Horsepower ranges from fractional to 120, output speeds from 8 to 425 rpm (Feb 10, p178).

SPEED REDUCERS—*Boston Gear Works, Hayward St, Quincy 71, Mass.* Optimount series of standardized basic units, with either single or double reduction helical gearing, can be mounted directly on the driven shaft or mounted in standard stock horizontal or vertical bases. Four sizes of basic units provide output speeds of 10 to 431 rpm and capacities of 1/6 to 15 hp (Oct 20, p216).

MINIATURE GEAR HEADS—*Daco Instrument Co, Tillary & Prince Sts, Brooklyn 1, NY.* Miniature gear head suited for use in control systems, indicating devices, computers, and servos is adaptable to standard Mark 7 motors. Ratios from 15:1 to 4300:1 are obtainable. Unit is capable of handling loads up to 50 oz-in. and momentary loads to 100 oz-in. Mounting to motor is simplified by an adapter ring (Feb 24, p152).



SPEED REDUCERS — *Boston Gear Works, Quincy 71, Mass.* Model R113 is a miter gear reductor with 1:1 ratio and a horizontal right-angle drive. Weight is 3.75 lbs; rated output ranges from 0.03 to 0.333 hp. Other two units are worm gear assemblies. Model T109 is designed with worm over, and Model U109 with worm gear under. Ratios for both range from 5:1 to 30:1, and output from 0.03 to 0.08 hp (Feb 10, p166).

SPEED REDUCERS — *Pic Design Corp, 477 Atlantic Ave, East Rockaway, LI, NY.* Speed reducers (worm and wheel), Type DE, are furnished in exact, even-step ratios from 15:1 to 120:1 in three shaft sizes of ¼, 3/6, and ¼ in. in both 48 and 64 pitches. Available in ball-bearing design and oil-less bronze units with over 175 different ratios (Aug 25, p115).

SPEED REDUCERS — *Foote Bros Gear & Machine Corp, 4545 S Western Blvd, Chicago, Ill.* Worm gear speed reducers with 1/3 to 5 hp input have been added to Hygrade line. Each of four types is available in four sizes: 2, 2⅜, 2⅞, and 3⅜-in. center distances. Each size is available in 10 1/3:1, 20½:1, 30:1, 40:1, 50:1, and 60:1 ratios (Jul 14, p136).

SPEED REDUCERS—*Link-Belt Co, Dept PR, Prudential Plaza, Chicago 1, Ill.* Shaft-mounted speed reducers are available as: single reduction drives in six sizes, with nominal ratios of 5 to 1 and capacities up to 50 hp; and, double reduction drives in seven sizes, with nominal ratios of 15 to 1 and capacities up to 40 hp. Units can be mounted at angular as well as horizontal positions by using either tierod or foot mountings (Oct 20, p212).

HELICAL GEAR DRIVE—*Link-Belt Co, Dept PR, Prudential Plaza, Chicago 1, Ill.* Quadruple reduction helical gear drive, and new, larger sizes of double and triple reduction drives have been added to Link-Belt's In-Line line. Drives with capacities to more than 200 hp are available. Compact quadruple reduction speed reducer, furnished in five sizes, extends range of ratios as high as 2217 to 1 (Oct 6, p132).

GEAR BOX—*Tracer Control Co, 595 E Ten Mile Rd, Hazel Park, Mich.* In this 2-speed unit, hardened and ground worm and bronze worm wheel are standard Boston design and are available with 1, 2, 3, or 4 threads, depending on speed range desired. They are used with two sets of shaved, heat-treated steel spur gears. Spring-loaded indexing handle is provided for selecting neutral, one-to-one, or three-to-one ratio (Feb 10, p169).

SPEED REDUCERS — *Foote Bros Gear & Machine Corp, 4545 S Western Blvd, Chicago, Ill.* Shaft-mounted speed reducers with capacities from ¼ to 40 hp incorporate Duti-Rated life-time gearing, and are offered in single and double reductions with output speeds from 10 to 420 rpm at 1750 rpm input using standard V-belt drives. Units are available in shaft sizes from 1 7/16 to 3 7/16 in. (Jul 4, p144).

VARIABLE SPEED PULLEY—*Lovejoy Flexible Coupling Co, 4866-H West Lake St, Chicago 44, Ill.* Wide range of speeds can be obtained from small, constant speed motors by means of a double variable pitch unit. The High Ratio Pulley is furnished in two models. Fractional to ½-hp unit has a ratio of 6:1 with PD varying from 1.875 to 4.60. Fractional to 1-hp unit has a 7.2:1 ratio with PD from 2.40 to 6.50 (Nov 3, p138).

SHEAVE—*Allis-Chalmers Mfg Co, Milwaukee 1, Wis.* Vari-Pitch sheave, single groove "S" section, permits wider speed changes and increased horsepower transmission. It has a range of 5.5 in. minimum to 120 in. max. Designed to complement present "Q" and "R" section models, the sheave requires no more mounting space than the smaller "R" section sheave (Mar 24, p168).

VARIABLE-SPEED BELT—*Manheim Mfg and Belting Co, Manheim, Penna.* MVS variable-speed belt does not require dismantling of machinery for installation, is balanced to eliminate vibration, and can easily be adjusted for any length. Made of heat- and oil-resistant neoprene, belt is made up of a series of links held securely by special fasteners. It is available in a range of sizes to replace all types of variable-speed belts (Mar 24, p166).

VARIABLE-SPEED PULLEYS—*Lovejoy Flexible Coupling Co, 4866H West Lake St, Chicago 44, Ill.* Pulleys provide constant speed regardless of wide variations in load. Known as the Hi-Lo FHP line, pulleys are available in ratings of ½, ¾ or 1 hp at 1750 rpm. Speed ratios vary from 2:1 for the ½- and ¾-hp models to 2½:1 for the 1-hp model (Nov 17, p261).

DRIVES AND COUPLINGS—*Dodge Mfg Corp, Mishawaka, Ind.* Three larger Flexidynes have been added to company's line: an 18-in. unit for use as drive or a coupling; a 22-in. unit for use as a coupling; and a 27-in. coupling with a hp rating of 1000 hp at 900 rpm. A 6-in. Flexidyne, for coupling or drive applications on cranes, fans and small conveyors, is rated at 2 hp at 1800 rpm (Sep 22, p154).

GEARED FLEXIBLE COUPLING — *Link-Belt Co, Dept PR, Prudential Plaza, Chicago 1, Ill.* Type MC, for shaft diameters up to 7⅞ in., is designed for use as a motor coupling—for transmitting electric motor power to pumps, generators, and speed reducers. Coupling sleeve is of one-piece design, and coupling is enclosed in a two-piece metal cover (Jun 2, p126).

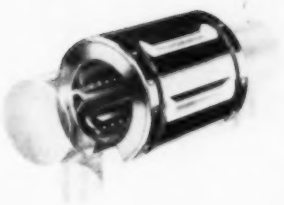
DRIVES AND COUPLINGS—*Dodge Mfg Corp, Mishawaka, Ind.* Drives and couplings, designated 5D and 5C, are the latest additions to company's Flexidyne Dry Fluid drive and coupling line. They are designed for ¼, 1/3, ½ and ¾-hp motors at 1750 rpm, and are recommended for use with light machines subject to jam-ups or to enable small motors to handle heavy starting loads (Jun 16, p146).

PRESSURE COUPLING — *Fawick Corp, Fawick Airflex Div, 9919 Clinton Rd, Cleveland 11, Ohio.* Rotorseal transmits air, liquids or gases from stationary sources into rotating shafts. It is widely used on air-operated machinery and machine tools to transmit air pressure for operating the company's clutches and brakes. Type B2 operates at speeds up to 4000 rpm, the C2 to 3000 rpm. Both are applicable to single-passage applications up to 150 psi (Apr 21, p266).

3-D CAMS—*American Cam Co, Inc, PO Box 2106, Hartford, Conn.* Cams produce an output motion determined by two input variables. Cams provide important savings in space and weight (Nov 3, p130).

ADJUSTABLE MOTOR BASE—*Rampe Manufacturing Co, 14915 Woodworth Ave, Cleveland 10, Ohio.* Model MB-1, designed to provide quick belt take-up for variable speed fhp drives, has a max ½-in. adjustment, telescoping slide, and locknuts to limit movement. Rigid base can be mounted in any position. Unit handles motors up to size 42 NEMA frame (Jun 2, p134).

COMBINATION ROLLER BEARING —*Rollway Bearing Co, Dept X2561, 541 Seymour St, Syracuse, NY.* Bearing designed for applications where both thrust and radial loads must be carried in a restricted space, consists of two roller assemblies with the flanged inner race of radial section serving as the revolving plate of thrust section. Units withstand temperatures up to approx 300 F (Oct 20, p238).



LINEAR BALL BEARING—*Thomson Industries, Inc, Manhasset, NY.* Open type unit permits use of shaft support members along the length of shaft traversed by the bearing. Bearings are made to standard dimension for shaft diameters from 1 to 4 in. Open construction permits adjustment of bore dia by set screws or other clamping devices (Apr 7, p136).

BEARING BUSHING—*Donley Products, Inc, 1106 Avon Ave, Cleveland 5, Ohio.* Straight-type roller bearing bushing is designed for replacement of the bronze bushing in the outer support of horizontal milling machines where limited diameter requirements exist. Compact design permits its use as an inboard as well as an outboard support by minimizing the loss of work area due to minimum overhang (Sep 22, p164).

ROLLER BEARINGS—*Sonnet Tool & Mfg Co, 580 N Prairie Ave, Hawthorne, Calif.* Roller bearings for milling machine outboard supports provide production increases of 40% and cutter life increases of 350%. Bearings are readily installed with no machine rework and no bearing adjustments. Each bearing is supplied with two extra sets of bushings which permit use with three sizes of arbors (Nov 17, p260).

ROLLER BEARING—*McGill Manufacturing Co, Bearing Division, Valparaiso, Ind.* Cage-type needle roller bearing, Cagerol, is offered in two standard sizes. Interchangeable dimensionally with heavy-duty needle bearings, this retainer-equipped unit will provide adequate capacity where excess misalignment prohibits using full-complement bearings (Jun 16, p162).

POWDER METAL BEARING—*Amplex Div, Chrysler Corp, PO Box 2718, Detroit 31, Mich.* Comprised chiefly of iron powders, the Iron Oilite 212 bearing is a general-purpose sleeve bearing reported to be more economical than comparable porous bronze bearings. The bearings have demonstrated performance equal to porous bronze, and can be used in a wide range of products where corrosion is not a problem and mechanical strength requirements are within tolerable limits (Dec 15, p134).

SLIDING MOTOR BASE—*Browning Mfg Co, Maysville, Ky.* Unit provides easy and rapid movement of motor in systems using variable pitch drives that require provision for more take-up than normal V-drives. Two sizes are available. One is for motors with NEMA frame numbers from 182 through 284U, and sells for $33.25; the other is for frame numbers from 286U through 365, and sells for $36.25 (Nov 17, p272).

BEARING SEAL — *Timken Roller Bearing Co, Canton 6, Ohio.* Duo-Face seal combines features of outside diameter seal and face-type seal. One lip operates in the bearing housing bore; other lip operates against face of the bearing cup. Seal is available on seven sizes of bearings (bore sizes), ¾, 27/32, 1, 1¼, 1⅜, 1½, and 2 11/16 in. (Feb 10, p180).

ROLLER BEARINGS—*Corlett-Turner Co, 9145 King St, Franklin Park, Ill.* Roller bearing line in the 90,000 Series has been expanded to include hardened-and-ground alloy-steel bearings in addition to the unhardened type. All are furnished with or without the split outer race (Jun 2, p136).

RADIAL BALL BEARINGS—*Industrial Tectonics, Inc, 3686 Jackson Rd, Ann Arbor, Mich.* Bearings suitable for operation in ambient temps up to 900 F are available from stock in sizes 200, 202, 204, and 206. Bearings are manufactured to ABEC 3 and 5 accuracy and operate at speeds up to 40,000 rpm without lubrication (Jun 16, p155).

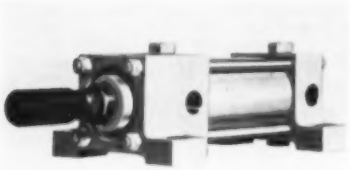
CLUTCHES — *Formsprag Co, 23601 Hoover Rd, Warren, Mich.* Ball-bearing clutches include three new sizes of high-speed unit for overrunning applications (max bore dia of 4, 5 and 6 in.); six sizes of sealed models (same bore dia) for indexing and back-stopping; new Model FS-1050 large-bore backstop clutch with max overrunning speed of 500 rpm, 9000-ft-lb torque capacity, max bore dia of 6 in. (Jun 16, p166).

OVER-RUNNING CLUTCH — *J-H Clutch Co, 16580 Northville Rd, Northville, Mich.* Clutch operates through snubbing or locking of a series of spiral-wound flat springs. During rotation of either race, the bands tighten to transmit torque; reversal will back-off the bands and permit free rotation. Outer race can be incorporated as part of a gear cluster or pulley (Dec 15, p145).

NEEDLE POINTS—*Robert A Main & Sons, Inc, 257 Pascack Rd, Paramus, NJ.* Points are available in lengths from ¼ up to 20 in. Variety of point shapes can be ground on ferrous and nonferrous wires in diameters from 0.020 to ½ in. These parts can have secondary operations performed on them, such as primary angle bending, heading, flattening, knurling. Parts are made to specifications (Jul 14, p139).

VIBRATION INDUCING DEVICE—*Martin Engineering Co, Neponset, Ill.* Model UCV Vibrolator, with its quick attaching mount, is used to cause motion of parts or powdered and granular materials in bins, hoppers and assembly fixtures. Ten sizes are available, ranging in force output from a few pounds to ¾ ton. Air operated, the device offers explosion-proof safety in hazardous locations (Apr 21, p188).

ENERGY CARTRIDGES—*Associated Spring Corp, Bristol, Conn.* Flexi-Pak Energy Cartridges are compact spring units that can be incorporated as a one-piece component. They are preassembled stacks of Belleville spring washers held together by a flexible elastic covering (Oct 6, p141).



HEAVY-DUTY CYLINDER — *Petch Mfg Co, 463 York St, Detroit 2, Mich.* Unit is designed for automation applications. It meets automotive manufacturers' heavy-duty cylinder standards. It is capable of 1000-psi hydraulic service with minimum 4:1 safety factor. All metal parts are treated for corrosion resistance (Mar 10, p192).

CYLINDERS — *Hydro-Line Mfg Co, 5600 Pike Rd, Rockford, Ill.* Line of air and hydraulic cylinders for heavy-duty service meets automotive industry automation standards. Hydro-Line Series S2 are rated at 1000 psi hydraulic, 200 psi air, and for non-shock load up to 1500 psi hydraulic. Nine bore sizes from 1½ to 8 in. are available; choice of 11 standard mountings (Mar 24, p146).

HYDRAULIC CYLINDER—*Tomkins-Johnson Co, Jackson, Mich.* Spacemaker high pressure hydraulic cylinder operates at pressures of 1000, 2000, and 3000 psi. Features described in catalog HSM5-58 (Jun 16, p156).

HYDRAULIC CYLINDER — *Hanna Engineering Works, 1765 Elston Ave, Chicago 22, Ill.* Powrdraulic Series is rated at 2000-psi shock and 3000-psi non-shock hydraulic pressures with a high safety factor. There are 13 basic mounting styles available and a choice of rod sizes for each bore (Apr 21, p242).

AIR-HYDRAULIC CYLINDER—*Electro-Mechano Co, 261 E Erie St, Milwaukee 2, Wis.* Unit has two movable cams that make it possible to set up any combination of fast, slow and skip-feed strokes. A built-in bypass valve with traveling rods allows rapid advance to any point in stroke, controlled rate of feed for any distance, pick up to rapid feed and return to controlled rate. This cycle can be repeated several times during stroke. Unit is available in 2-, 4-, 6-, and 8-in. stroke lengths (Dec 15, p132).

CHECKING CYLINDERS — *Modernair Corp, San Leandro, Calif.* Designed for use with air cylinders to smooth out stroke variations under irregular loads, these Veri-Trol hydraulic checking cylinders are available with 2, 4, 6, 9, 12, 15 and 18-in. checking stroke lengths. Max checking capacity is 2000 lb on the out stroke, with free return (Apr 21, p197).

HYDRAULIC CYLINDERS—*Galland-Henning Nopak Division, Milwaukee, Wis.* Class 3 square-head hydraulic cylinders (3000 psi) have been augmented with six new models and additional bore sizes. Line now provides a total selection of 19 basic mountings, or models, and bore sizes from 1½ through 12 in. (Nov 3, p144).

PROGRESSING-CAVITY PUMP — *Robbins & Myers, Inc, Springfield, Ohio.* Moyno pump is designed to pump highly abrasive slurries. The tool steel rotor is a true helical screw; the synthetic rubber stator has a double internal helical thread. The rotor sweeps the entire stator surface in each complete revolution. Advantages include long life, low turbulence, positive pressure, and uniform discharge (Sep 8, p130).

HYDRAULIC MOTOR PUMP — *Tal Bending Equipment, Inc, Milwaukee 2, Wis.* Portable unit weighing 65 lbs is rated for 10,000-psi intermittent and 5000-psi continuous duty delivering 80 cu in. of oil per minute. In addition to use with hydraulic benders, pipe pushers, knock-out punches, hydraulic jacks, it can be installed and adapted to give fast, continuous power to existing equipment (Mar 10, p192).

TRIPLE DISCHARGE PUMP—*Ruthman Machinery Co, Cincinnati 2, Ohio.* Model 5P-4521 has triple discharges which may be used individually, simultaneously, or in any combination. It can handle clean coolant as well as liquid containing grit and abrasives. Pump is furnished with 1/10-hp, 1725 or 3450-rpm and ¼-hp, 3450-rpm motors, for heads up to 30 ft and capacities up to 30 gpm (May 19, p176).

PUMPS—*Webster Electric Co, Hydraulics Div, Racine, Wis.* Hydraulic pumps, low volume, gear type, designed for high pressure needs with low power consumption are offered for hydraulic lift applications as well as the electric lift truck field. Pressures obtainable, according to capacity, are (at 1750 rpm): 1.35, 2.4, 3.0 and 3.7 gpm—up to 1500 psi; 0.5, 0.75, 0.9, and 1.2 gpm—up to 2000 psi (Jun 16, p169).

FLUID MOTORS — *New York Air Brake Co, Hydreco Div, Kalamazoo, Mich.* Gear-type fluid motors designated 4MO Series, are rated from 90 to 210 in.-lb torque per 100 psi, for operating pressures to 1000 psi. They are available in both flange and foot mountings, with ports designed for SAE split-flange connections (Nov 7, p256).

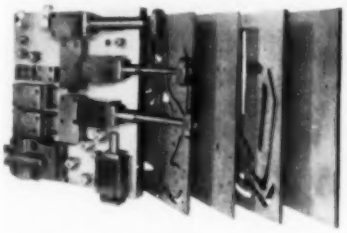
CONTROL VALVE—*Clarkson Co, 561 Market St, San Francisco 4, Calif.* Model C is designed for responsive control and is especially suited to handling abrasive and corrosive slurries. A cast steel housing jackets a 1-in.-thick gum rubber or Neoprene sleeve liner. Valve is available in 1½, 2, 3, and 4-in. sizes (Nov 17, p273).

VALVES—*Hanna Engineering Works, 1765 Elston Ave, Chicago 22, Ill.* New valve lines include the Flo-Set 1000, a hydraulic speed control valve for 1000 psi; the Flo-Pilot two- and three-way pilot air valves for 150-psi operation; and Flo-Line three- and four-way solenoid and master air valves for 20 to 150-psi operation (Apr 21, p287).

FOUR-WAY VALVES—*Denison Engineering Div, American Brake Shoe Co, Columbus, Ohio.* Pilot-operated solenoid-controlled valves provide all porting and positioning arrangements on circuits up to 3000 psi. They are shorter than comparable valves, and feature drawn-steel solenoid covers and short solenoid power stroke. Capacities are 30 gpm and 5 gpm for the ⅜-in. pilot and ¼-in. solenoid valves respectively (Apr 21, p276).

CHECK VALVES—*Denison Engineering Div, American Brake Shoe Co, 1160 Dublin Rd, Columbus, Ohio.* Hydraulic check valves, for use in systems up to 5000 psi, are available in both subplate and sandwich types, and in ¾ and 1¼ in. sizes. The ¾-in. valves pass 20 gpm; and 1¼-in. valve, 65 gpm. Spring loading of the poppet allows the valve to be mounted in any position (Dec 1, p160).

CHECK VALVES—*Kepner Products Co, 7343 West 59 St, Box 407, Summit, Ill.* Spring-loaded check valves, tradenamed Kep-O-Seal, are designed for hydraulic and pneumatic service. The flexible seal in the seating area will close around any dirt or foreign particles that may get into the line. Standard working pressure is 3000 psi hydraulic; standard temperature range, −40 F to +280 F (Nov 3, p143).



HYDRAULIC CONTROL MANIFOLDS—*Almo Tool Co, 11470 Klatz Ave, Centerline, Mich.* Manifolds consist of a series of steel plates. Back plate is solid except for mounting holes. Next plate has torch-cut channels for oil passages, while middle plate has transfer ports to connect with similarly cut passages in fourth plate. Fourth plate lines up with valve and power line ports in top plate. When plates are hydrogen brazed together, the channels are sealed-in (Sep 22, p136).

HYDRAULIC VALVE—*John S Barnes Corp, 310 S Water St, Rockford, Ill.* Directional control valve provides remote control of flow for hydraulic actuation. The ¼-in., 4-way, 2-position valve is solenoid operated, has an operating pressure of 1000 psi and a flow capacity of 3.5 gpm. Weight is approx 11 lb (Dec 29, p76).

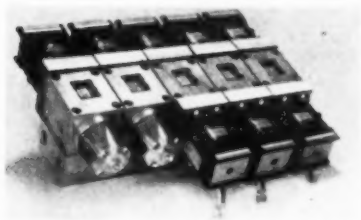
LIQUID SPRING — *Taylor Devices, Inc, 188 Main St, North Tonawanda, NY.* Liquid Spring Shok has built-in time delay of one second. Standard model may be modified to provide time delay return up to ½ hr on a ½-in. stroke. By absorbing 98% of the input energy, unit returns the dampened device from 1 second to 30 minutes. Also available with adjustable energy absorption rates (Jul 14, p132).

VACUUM PUMPS—*F J Stokes Corp, Vacuum Equipment Div, 5500 Tabor Rd, Philadelphia 20, Penna.* Mechanical booster vacuum pumps operate at faster pumping speeds in the pressure range from 10 microns to 1 millimeter than comparable units. The first four models in the series, Models 1710, 1711, 1712, and 1713, have max pumping speeds of 1050, 1250, 2900, and 5100 cfm respectively, and an ultimate vacuum of ½ micron (Nov 17, p272).

AIR CLUTCH — *Conway Clutch Co, 1105 Marshall Ave, Cincinnati 25, Ohio.* Stationaire eliminates need for rotating unions, shaft drilling, and shaft sealing. It can be mounted anywhere, even in the middle of a long shaft. This is accomplished by new design that makes the air housing and piston nonrotating with respect to the rest of the unit (Dec 15, p130).

AIR LINE REGULATORS — *Mead Specialties Co, Dept R-½, 411½ N Knox Ave, Chicago 41, Ill.* Air line regulators and lubricators are designed for use with the company's Mead Jet filter. In the lubricator, acceleration of air passing through a venturi forms the oil mist, instead of air pressure. Oversized air passages in the regulator permit pressure regulation without any material reduction in flow (Nov 17, p276).

AIR LINE FILTER—*Gits Bros Mfg Co, Pneumatics Div, 1866 S Kilbourn Ave, Chicago 23, Ill.* Filter removes harmful moisture, rust, pipe scale and other contaminants from air lines, to prevent damage and excessive wear to pneumatic equipment. Filter was designed specially for use in connection with the company's matched-set air line lubricators but may be used in other air line lubrication systems (Jul 28, p116).



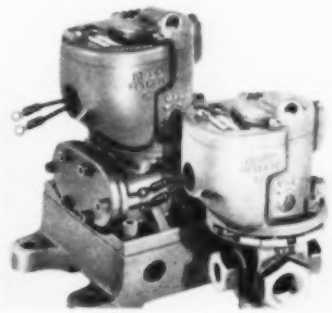
MINIATURE VALVES—*Beckett-Harcum Co, 1087 Wayne Rd, Wilmington, Ohio.* Minature, sub-plate mounted, solenoid-operated valves for air and hydraulic services are available in seven spool types to meet all requirements. Specifications include operating pressures of 150 psi air and 2000 psi hydraulic; nominal ¼ in. capacity; brass and stainless steel in contact with media (Oct 20, p193).

CONTROL VALVES—*C B Hunt & Son, Inc, Salem, Ohio.* The pilot-operated BJ-type solenoid valve is rated at 600 cpm for continuous operation on air at 40 to 150 psi. It is available in single and double solenoid design, 2-, 3-, 4- and 5-way actions, in lever and cam operated types. Series CJ solenoid valves are designed for use with air to 125 psi, and temperatures up to 150 F, also for vacuum service (Apr 21, p259).

SOLENOID VALVE—*Atkomatic Valve Co, 545 W Abbott St, Indianapolis 25, Ind.* Two-way solenoid valve, the general-purpose Shorty, is 4¾ in. high by 3 in. wide with height from top to line of 3 13/16 in. Applications include air and gases up to 250 psi; water to 150; oil to 75; and steam to 25. Units are available in four pipe sizes: ¼, ⅜, ½, and ¾ in. (Nov 3, p144).

INCHING AIR VALVES — *Mead Specialties Co, Dept I-½, 411½ N Knox Ave, Chicago 41, Ill.* Valves will advance the ram of a double-acting air cylinder to any desired point and stop it dead at that point. Cylinder will remain there without creeping, according to manufacturer. Valves can be used in many applications previously reserved for hydraulics (Oct 20, p198).

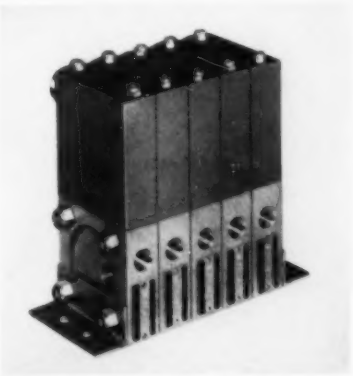
PNEUMATIC VALVE—*Ross Operating Valve Co, Detroit, Mich.* Lifeguard C consists of two 3-way valve units connected in parallel, each having its own pilot valve operator and solenoid actuator. It offers greater safety for operators of pneumatic-clutch or clutch-brake-controlled power presses by sensing any potential malfunction within itself and locking-out to prevent unsafe operation (Sep 22, p161).



VALVES—*Ross Operating Valve Co, Detroit, Mich.* Skyline Series is available in several new models. Gold model has an oil-immersed solenoid with locking manual actuator, and has a tested life of over 40 million cycles. Silver model is a spool solenoid pilot valve with a life of over 25 million cycles. White model spool solenoid pilot valve has a life of over 20 million cycles (Apr 21, p274).

AIR VALVES—*A Schrader's Son, Div of Scovil Mfg Co, Inc, 470 Vanderbilt Ave, Brooklyn 38, NY.* Two- and three-way valves, poppet-type, have specially designed brass bodies with ¼-in. inlet and outlet ports. Valves have a 70-cfm air flow capacity. They are offered with four different types of lever action: roller lever, solid angle lever, hand lever, and hand lockdown lever (April 21, p255).

VALVE—*Dixon Automatic Tool, Inc, Rockford, Ill.* Four-way slide valve, designed to actuate pneumatic equipment, controls automatic advance and retraction, offers adjustable dwell time and speed control. Designated the Control-Pac, valve can be used effectively to obtain reciprocating action of double-acting cylinders with either long or short stroke (Jan 13, p170).



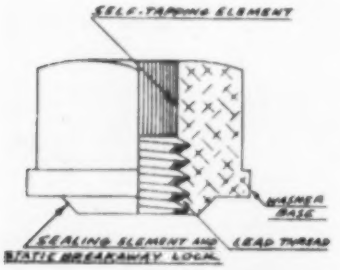
SOLENOID CONTROL VALVE—*Hunt Valve Co, Inc, Salem, Ohio.* Quick-As-Wink S-3C-S is only 1 in. thick, 3 in. wide and 6 1/16 in. high. Designed for oil or air use at pressures to 125 psi and temperatures to 150 F, valve is furnished tapped for either ⅛ or ¼-in. pipe connections. It is rated at 300 cpm for continuous operation and up to 700 cpm for intermittent service on air at 20 psi (Nov 3, p140).

SOLENOID VALVES — *A Schrader's Son, Div of Scovill Mfg Co, 470 Vanderbilt Ave, Brooklyn 38, NY.* Four-way valves are available with single or double solenoids, and with or without sub-base. They are furnished for 110, 220, or 440v current in four sizes: ¼, ⅜, ½ and ¾ NPT and are suitable for continuous or intermittent duty (May 19, p182).

EXHAUST MUFFLER—*Emco Pneumatic Corp, 1317-1319 Locust St, Des Moines, Iowa.* Exhaust muffler, called Silent Air, for all pneumatic air devices, reportedly cuts noise to almost complete silence. Both male and female connections are standard on each unit for quick, easy installation (Sep 22, p163).

AIR CYLINDERS — *Cushman Chuck Co, Hartford, Conn.* Air cylinder designed primarily for use with company's aluminum-body air chucks, is reported to operate efficiently with any other air chuck. It has an aluminum body and is designed for operation at spindle speeds up to 7000 rpm (Apr 21, p287).

AUTOMATIC-RETURN CYLINDERS —*A K Allen Co, 255 E 2nd St, Mineola, LI, NY.* Four new lines of automatic-return and a new line of automatically-reciprocating air cylinders have been added to company's AllenAir line of power cylinders. Also available are automatically-reciprocating models (Mar 10, p176).

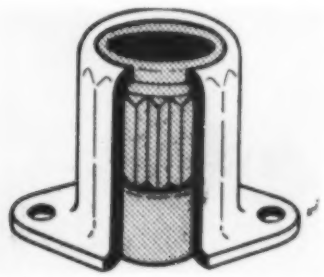


SELF-TAPPING-NUT — *Byrd Plastic, Inc, 2953 W 12 St, Erie, Penna.* Brilok nylon stop nut locks at any position along shank of screw. As screw turns into resilient nylon, a counter-compressive force is built up, resulting in friction lock. Further tightening causes cone at base of nut to extrude into clearance spaces, forming effective seal. Available in sizes Nos. 4, 6, 8, 10, ¼, 5/16, ⅜ and ½ in. (May 19, p185).

SOCKET SETSCREWS—*Bristol Co, Socket Screw Div, Waterbury 20, Conn.* Socket setscrews and keys are available in kits containing 50 each of selection of sizes from No. 4 up to No. 10 and ¼ in. dia. Kit No. 210 is made up of hex socket screws; No. 211, multiple-spline socket screws. All are Class 3A fit (Jun 16, p138).

ANCHOR BOLT FITTING—*Decatur Engineering Co, 519 E William St, Decatur, Ill.* Deco Anchor is flush with the floor until installation of equipment. An oblong nut in the box-like fitting attached to the top of the anchor bolt moves far enough in all directions to compensate for usual error in setting anchor bolts. Machine is attached to fitting by a stud of desired length (Jun 2, p132).

SANDWICH PANEL FASTENER — *Delron Co, 5224 Southern Ave, South Gate, Calif.* New unit designed to provide additional strength for a variety of sandwich panels consists of two pre-assembled parts: body and expanding sleeve. Body section is available in many forms including internal threaded, threaded stud, male rivet, and through-bolt types. In use, the unit is retained in panel by a splined interlock which also prevents rotation (Nov 17, p268).



SHIM NUTS—*William H Snow Co, 1413 E Franklin Ave, El Segundo, Calif.* Universal shim nuts eliminate use of stacked shims under nuts. Nut is designed to meet all required push-out, torque-out, and compression loads and is coded by color for identification of different heights (Feb 10, p158).

FASTENER — *Tinnerman Products, Inc, Cleveland 1, Ohio.* Dart-type Speed Clip made from heat-treated spring steel has been developed for retaining printed circuit panels to radio and television chassis. It not only retains circuit boards to panels, but provides a positive electrical ground at points where it is inserted around the circuitry (Jun 16, p154).

CAPSCREW—*Parker-Kalon Div, General American Transportation Corp, Clifton, NJ.* Socket head capscrew called Pre-Lode has more wrenching area and an enlarged bearing surface, and is designed to eliminate indentation while using and maintaining full holding power under highest tensile load. Fastener is available in all standard sizes from ¼ to 1 in. (Nov 17, p280).

THREADED INSERTS—*Yardley Precision Products Co, 35 Afton Ave, Yardley, Penna.* Aluminum threaded inserts for molding in plastics, rubber and ceramics may be used separately or combined as male and female components of two halves of a molding. Class II threads conform to ASME specifications in thread sizes from 4-40 to ½-28 (Jul 28, p116).

RETAINING RINGS—*Rotor Clip Co, 11¼ Allen Blvd, Farmingdale, LI, NY.* Rotor Clips come in all standard sizes and styles. Standard rings are carbon spring steel with oil-dipped finish. Each ring is engraved with ring size. Special tapered design lowers the stress at mid-section. Rings are also available stacked on rods for automatic assembly operations (Jun 16, p138).

SPEED NUT — *Tinnerman Products Inc, Box 6688, Cleveland 1, Ohio.* Push-on type nut provides rapid, secure fastening for name plates, emblems and other forms of identification. The fastener's twin push-on impressions allow it to accommodate two 3/32-in. studs with center-to-center dimensions ranging from ¼ to ⅝ in. (May 19, p174).

SOCKET-HEAD CAP SCREWS — *Standard Pressed Steel Co, Jenkintown, Penna.* Unbrako screws have significantly increased head dimensions permitting utilization of up to 133% more of the screws' holding power. Fasteners range in size from ¼ to 1-in. in diameter (Apr 21, p279).

FASTENERS — *Huck Mfg Co, 2480 Bellevue Ave, Detroit 7, Mich.* Huckbolt fasteners fabricated from high-alloy die steels and a variety of stainless steels are recommended for use at high temperatures when high strength is required. Among the materials are AISI Types 321 and 431 stainless, A286 and 17-4 PH stainless, Vasco-Jet 1000 alloy steel and Thermold J alloy steel (Jun 16, p149).

BLIND RIVET—*Huck Manufacturing Co, 2480 Bellevue Ave, Detroit 7, Mich.* Daisy blind rivet, made of steel, is available in two lengths. Each size has a 7/16-in.-dia. washer collar. One size has a ⅝-in. split sleeve length and a 0.032- to 0.250-in. grip range; the other has a ⅞-in. split sleeve length and a 0.032- to 0.375-in. grip range (Jul 14, p142).

TWO-POINT NUT—*Kaynar Mfg Co, Inc, Box 2001, Terminal Annex, Los Angeles 54, Calif.* Kaylock H50 is a miniature self-locking nut that yields space savings of up to 40% while weighing less than conventional hex nuts. Wrenching is done on the threaded nut element itself, which is provided with two integral wrenching points. Nut is available in sizes 4-40, 6-32 and 8-32 (Aug 25, p108).

TUNGSTEN CARBIDE — *Allegheny Ludlum Steel Corp, Pittsburgh 22, Penna.* This ultra-hard steel-cutting tungsten carbide, CA-604, is a super-high-speed cutting material that operates in the fast cutting ceramic area. It retains its high strength at high cutting temperatures, and provides rapid finishing with light to medium feeds. At this time the material is offered only in indexable blanks (Dec 1, p139).

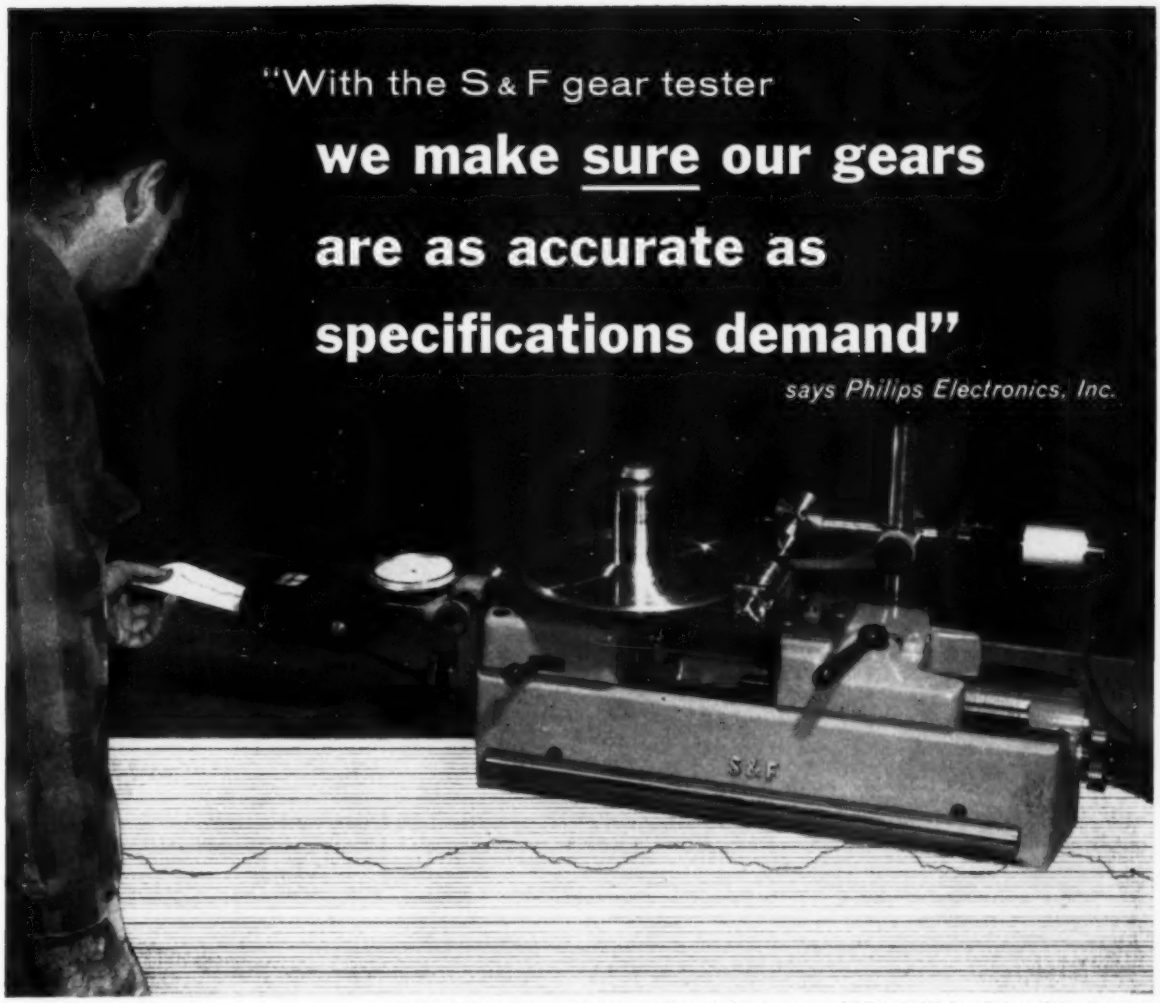
ALUMINUM TOOLING PLATE—*Red Seal Metals Co, 10035 Burtis St, South Gate, Calif.* Cast under highly controlled conditions, then stress relieved and machined top and bottom on planer mills, these "775" plates are reported to be entirely free of internal stresses. They will not change dimensionally after cutting or welding. Material has wide application for machine tool fixtures, assembly jigs, and hydropress form blocks (Jul 14, p121).

SINTERED TUNGSTEN-CARBIDE POWDERS — *Shwayder Chemical Metallurgy Corp, 684 E Woodbridge, Detroit 26, Mich.* Mikrocarbide line has been introduced for hard-surfacing, abrasives, diamond settings, plastic dies, and other applications where a hard, wear-resistant material is required. Powders are available in any mesh size from 3 to 325. They can also be furnished with copper, nickel, or special alloy coatings (Oct 20, p222).

SHOCK-RESISTANT STEEL — *Crucible Steel Co of America, Oliver Bldg, Pittsburgh 22, Penna.* LaBelle HT tool steel is an improved shock-resistant steel that offers toughness at high hardness levels, for applications requiring unusual resistance to shock or impact, such as shear blades, impact extrusion tools, cold heading dies and punches, and coining and striking dies (Jun 2, p126).

HIGH-TEMPERATURE ALLOY — *Carpenter Steel Co, Reading, Penna.* Lapelloy C is used for highly stressed jet-engine parts involving service temperature up to 1200 F. It has greater ductility and impact strength at both room and elevated temperatures than conventional Lapelloy when heat-treated to same strength level. Material offers best corrosion resistance when in the hardened and tempered condition (Jun 2, p119).

HIGH-TEMPERATURE ALLOY — *Westinghouse Electric Corp, PO Box 2099, Pittsburgh 20, Penna.* Vacuum melted alloy, W-545, for high-strength applications at temperatures up to 1350 F, is easily fabricated for use in parts such as turbine wheels, couplings, shafts, valve stems, and bolts in missiles, and gas or steam turbines. The alloy is composed of six elements; iron, nickel, chromium, and in smaller amounts, molybdenum, titanium and manganese (Sep 22, p133).



Section of Graphotest record checking out 10" pitch diameter gear on S & F Model 110 Gear Tester at Philips Electronics.

there's no gear tester as accurate as the S & F—

GUARANTEED TO REPEAT WITHIN .00001"!

The engineer sets down his gear specs. The gear hobber goes to work. The gear tester checks out the finished gear. Perfect! *But is it?*

The plain fact is that the gear tester is all too often the weakest link in the chain. And until the S & F came along, manufacturers had no sure way of knowing their "precision" gears were as precise as they were supposed to be.

No such doubt exists at Philips Electronics. Shown above is a special spur gear used on the Norelco Goniometer. Its basic pitch diameter is 10", diametral pitch 36", number of teeth 360. Print specs call for a total composite error on 360° rotation of .001" and the gear must be concentric within .0003", total indicator reading. Pretty close tolerances for a gear of this size.

Has Philips achieved it? They're never in doubt. "We are now able to verify the accuracy of our gears to an extent never before possible," say Philips engineers.

And this experience is typical of hundreds of precision-minded plants all over the country who are producing gears that *must* check out—and do—on S & F Testers.

We'd like nothing better than to show you how the S & F is revolutionizing gear checking. Or talk to any users near you. We'll send you their names.

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KURT ORBAN

COMPANY, INC.

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ZINC-BASE ALLOY—*Morris P Kirk & Son, Inc, Subsidiary of National Lead Co, 2717 S Indiana St, Los Angeles, Calif.* A new high-strength zinc-base alloy known as Hi-phy Kirksite is reported to cut die weights up to 20%. Stamping and forming dies made of the new material have a much longer life. Higher physical and mechanical properties of Hi-phy Kirksite are typified by the 400% greater impact strength it possesses over Kirksite-A (Mar 24, p172).

STEEL—*LaSalle Steel Co, PO Box 6800-A, Chicago 80, Ill.* The addition of copper to company's Stressproof steel bars has resulted in a 10% (approx) increase in machinability compared with regular Stressproof. Tool life during machining operations is reported to be improved by 25 to 150%. Other improvements include increased wear and corrosion resistance (Jan 13, p160).

FERRO-COLUMBIUM — *Shieldalloy Corp, Newfield, NJ.* New grade with high columbium-to-tantalum ratio—about 40:1—is said to be especially advantageous in the manufacture of stainless steel components of nuclear reactors, since tantalum has the disadvantage of capturing neutrons (Feb 24, p162).

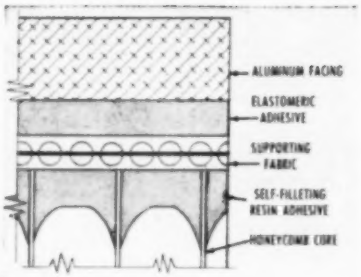
CUTTING TOOL MATERIAL—*Vascoloy-Ramet Corp, Subsidiary of Fansteel Metallurgical Corp, 800 Market St, Waukegan, Ill.* Ceramic VR-97 is suitable for speeds of 2000 sfpm and up, feeds to 0.020 in., and cuts to depth of ⅜ in. Another material, VR-54, of milling-cutter-grade tungsten carbide, is designed for cutting chilled iron, cast iron, nonferrous and nonmetallic materials (Jan 13, p170).

CUTTING MATERIAL—*Firth Sterling Inc, 3113 Forbes St, Pittsburgh 30, Penna.* A new cermet grade, Firthite WF is a cutting material that contains neither tungsten nor cobalt. It has a titanium carbide base with molybdenum carbide additions, using nickel as a binder (Apr 21, p194).

SILICONE RUBBER COMPOUND—*Connecticut Hard Rubber Co, 407 East St, New Haven 9, Conn.* Compound M-717 has compression-deflection characteristics approximating those of firm sponge, yet provides the tensile, tear, and elongation properties of a higher-durometer compound. Compound will be available in made-to-order sheets, moldings, and extrusions (Sep 8, p154).

ADHESIVE—*Rubba, Inc, 1015 E 173rd St, New York 60, NY.* No. 387 Rubbaweld has been developed for bonding polyethylene linings to steel tanks and other surfaces. The self-vulcanizing material eliminates need for application of primers to either the metal or polyethylene. Adhesive will withstand temp of 350 F, does not become brittle when cold (Jun 16, p155).

ADHESIVE—*Rubba, Inc, 1015 E 173rd St, New York, NY.* Adhesive called Rubbaweld for bonding rubber and fabric to metal, and plastic and rubber to metal is said to provide a flexible, shock-resistant bond that is impervious to most oils, acids, and alkalies. Self-curing product can be applied by brush or coating machine (Feb 10, p185).



HONEYCOMB ADHESIVES—*Minnesota Mining and Mfg Co, Adhesives, Coatings & Sealers Div, 423 Piquette Ave, Detroit 2, Mich.* New heat curring, supported, composite film adhesives consist of a high-strength elastomeric adhesive film on one surface and a self-filleting adhesive on the other. Elastomeric adhesive bonds to the facing and the self-filleting adhesive bonds to the core of the honeycomb sandwich panel. Service temperatures range from —70 F to +250 F. New films eliminate sandwich core priming (Mar 24, p152).

HEAT-RESISTANT CERAMIC—*Duramic Products, Inc, 262-72 Mott St, New York 12, NY.* Pressed ceramic parts able to withstand extreme thermal changes, such as water quenching from 2200 F, are now available in production lots fabricated in a new material known as ThermoShock HT-2. Applications include welding jigs, brazing jigs, and sintering fixtures, insulators, missile and aircraft heat barrier parts, furnace parts and welding nozzles (Jun 30, p107).

MARKING MATERIAL — *Phillips Products, Inc, 1435 E 17th St, Cleveland 14, Ohio.* Penapaint can be placed on bare metal to identify stock; it instantly penetrates subsequent paint coating. Applied with brush, spray, or stencil either before or during fabrication, it remains through all following fabricating and assembly operations. It can be removed when no longer required by application of Penapaint Mask (Oct 6, p134).

PRESSURE SENSITIVE TEFLON TAPE — *Flexrock Co, Packing Div, 3600-A Filbert St, Philadelphia 1, Penna.* Tape can be attached to metals, wood, rubber, glass, plastics, and other rigid materials by contact. It is produced in sizes ½ in. up to 12 in., 0.005 in. thick, packaged on standard 100-ft spools (Jul 28, p121).

CONTINUOUS THREADED ROD — *Precision Steel Warehouse, Inc, Mfg Div, 421 Maple Ave, Downers Grove, Ill.* Rod is the latest addition to company's line of toolroom specialties. It is available in a wide range of sizes and lengths, and may be had in steel and other metals. Literature available (Jun 16, p149).

CLAD STAINLESS—*American Silver Co, 36-07 Prince St, Flushing 54, NY.* Silver-clad stainless steel can be used as an inexpensive, durable, electrical contact material. It is supplied as a cladding on one or both sides of a stainless base, or as an inlay in the base, or as a strip on the edge of the base (Jun 16, p154).

PRESSURE-SENSITIVE TAPE—*Durable Rubber Products Co, 609 W Lake St, Chicago 6, Ill.* Twin-Stick No. 9 is coated on both sides with adhesive. The release paper overlaps the adhesive film by one eighth of an inch, making it easy to remove the release paper after tape is applied. Tape is available in 72-yd-long rolls in a variety of widths (Aug 11, p141).

PROTECTIVE COATING—*American Nickeloid Co, Peru, Ill.* Mar-Not protective coating protects pre-finished metals during severe drawing and forming operations. It is available in two forms. Type M is a pressure-sensitive paper; type C is a stripping-type plastic film which stretches as the metal is formed (Jan 13, p156).

STEEL RODS—*Lavallee & Ide, Chicopee, Mass.* High-speed-steel rods, hardened and centerless ground to a tolerance of 0.0002 in., are available in a range of sizes from 3/64 through ¼ in. in 36-in. lengths. Rod is said to be ideal for making punches, dies, gages, pins, dowels, collets, tools and many other steel parts (Nov 7, p261).

COLORED STAINLESS STEEL — *Electro Metallurgical Co, Div of Union Carbide Corp, 30 E 42 St, New York 17, NY.* Stainless steel colored by the Permyron process can be deep-drawn, bent, roll formed, embossed, adhesive-bonded and fabricated by other conventional methods after coloring, without damage to colored surface. Typical tensile tests show that there is no visible effect on coloring up to about 50% elongation of specimen (May 5, p151).

PRECISION GROUND FLAT STOCK —*L S Starrett Co, Athol, Mass.* Free-machining low-carbon flat stock, Starrett No. 498, is available in 24-in. lengths in widths from ⅜ to 16 in. and in thicknesses from 1/16 to 2⅞ in. Material has a machinability rating of 91% against 72% for most low-carbon steels. Each piece is identified along the full length with the words "Starrett Low Carbon" (Oct 20, p196).

EXPANDED METAL — *US Gypsum Co, 300 W Adams St, Chicago 6, Ill.* Decorative expanded metals are introduced in three new patterns, Armorweave and Festoon in 1½-in. wide mesh openings, and Cathedral. Aluminum or carbon steel sheets, available in standard sheet sizes or sheared to specifications, may be curved, formed, welded, and cut without raveling (Jul 26, p116).

STEEL BARS—*LaSalle Steel Co, 1420 150th St, Hammond, Ind.* "Fatigue-Proof" steel bars are now available in hexagon shapes in sizes from ¼ through 1½ in. Rounds are now available in sizes from ¼ through 2 3/16 in. Sizes up to 2½-in. round can be furnished on inquiry (Sep 22, p160).

TOOL STEEL—*Brown & Sharpe Mfg Co, Providence, RI.* Ready Mark Tool steel is a pre-colored, dark blue, oil hardening flat stock. It is ready for marking or layout, right from the envelope. Finish is rust resistant and does not affect heat treatment. Material is available in full range of sizes from 1/16 in. thick to 14 in. wide, all 18 in. long (April 21, p287).

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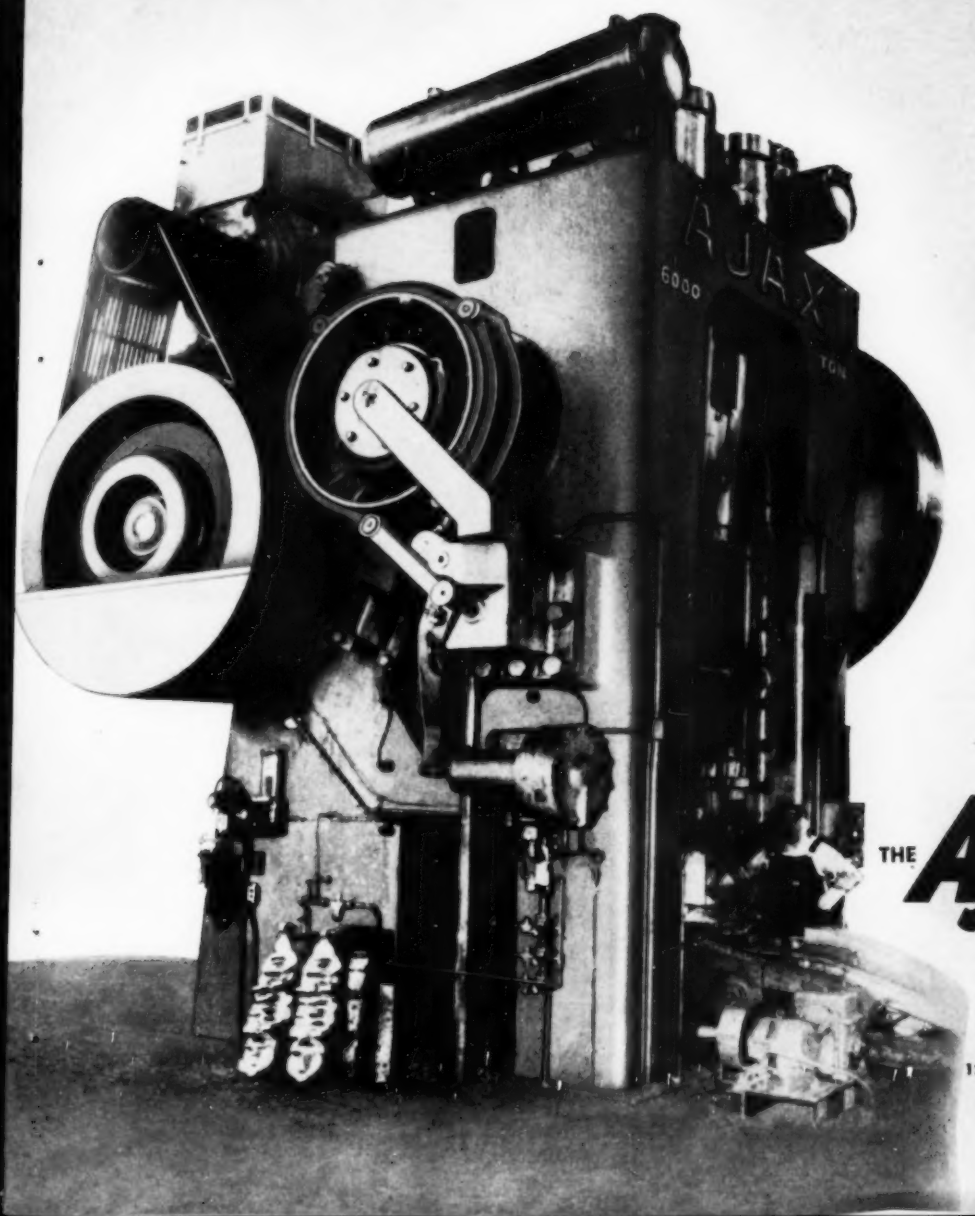

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METAL-FILLED EPOXY RESIN — *American Latex Products Corp, 3341 W El Segundo Blvd, Hawthorne, Calif.* Stabond EP Series metal-filled epoxy resin is two-component, room-temperature-curing system for making strong castings with properties similar to metal castings; making molds for short run use; and filling voids and plugging holes in all metal structures, wood and plastics. It is reported to have excellent machining properties (May 5, p156).

WIRE CLOTH—*Imported by J R Mills & Co, 1900 Winnetka Ave, Northfield, Ill.* Woven wire cloth is available up to 500 mesh; openings to 2 microns; all metals and alloys; all weaves, specialties. Pieces cut to specification (Jul 14, p132).

PLASTIC STEEL ADDITIVE—*Devcon Corp, Danvers, Mass.* Devcon Flex mixes with company's Plastic Steel to produce a part that will stand up to sledge-hammer pounding without breaking. The mixture is said to provide the strength of metal combined with the flexibility of rubber. Many applications are seen in the forming die field and in repair of metal parts (Nov 17, p261).

PRE-PLATED STEEL — *American Nickeloid Co, Peru, Ill.* Pre-plated steel is available in a low-cost utility grade, called C-grade steel base, in chrome, nickel and copper finishes. Product is furnished in sheets, 24 x 96 in. and up to 160 in.; coils ⅛ to 24 in. wide; flat strips, ¼ in. or wider up to 96 in. long. Gages 0.008 to 0.036 in.; temper, No. 4 (Jun 16, p152).

EPOXY MOLDING COMPOUND — *Minnesota Mining & Mfg Co, Dept FS-160, 900 Bush St, St Paul 6, Minn.* Reinforced epoxy resin molding compound, Scotchply Molding Compound Type 1100, offers high strength coupled with high conformability. The material, supplied in dry form, is adaptable to compression or transfer molding processes. Material has average flexural strength of 100,000 psi, average tensile strength of 40,000 psi and an average compressive strength of 38,000 psi at normal temperatures (Aug 11, p124).

EPOXY GLASS-BASE LAMINATE—*National Vulcanized Fibre Co, Box 311, Wilmington, Del.* Phenolite Grade G-11-861 retains 70% to 80% of its original flexural strength when tested at 150 C after conditioning for one hour at that temperature. G-11 is also made as Copper Clad Phenolite Grade G-11-861-1 for printed circuit applications (Jun 16, p140).

TOOLING COMPOUND — *Minnesota Mining and Mfg Co, Dept B9-32, 900 Bush St, St Paul 6, Minn.* Two-component (steel and epoxy-type resin) punch-and-die material, 3M tooling compound 113, is designed for use in place of expensive machined metal tools for prototype or short-run draws of difficult shapes. Compound is more than 90% steel, has a compressive strength of 0.4 ft-lb per in. of notch (April 7, p124).

HIGH-DENSITY POLYETHYLENES —*Bakelite Co, Div of Union Carbide Corp, 30 E 42 St, New York 17, NY.* These polyethylene materials (AM-Apr 7 '58, p75) possess a unique combination of properties. The linear molecular structure provides thin-wall stiffness, low permeability, high service temperature, freedom from distortion at elevated temperatures, impact resistance, high gloss and colorability, good abrasion resistance, and good thin-wall electrical insulation (May 19, p150).

SEALING RESIN—*Columbia Technical Corp, 61-02 31st Ave, Woodside 77, NY.* Impal seals small cavities, cracks, and pores in anodized aluminum or aluminum alloys. Liquid product has surface tension much lower than the capillary resistance of the smallest pores. After curing, it forms a seal which resists acids, alkalis, and saline atmosphere. Impal-sealed surfaces may be coated with any standard coating material or paint (Oct 6, p136).

LAMINATING RESIN—*Furane Plastics, Inc, 4516 Brazil St, Los Angeles 39, Calif.* Epocast 10K can be used for preparation of high-temperature plastic tooling. It is reported to be effective in bonding jigs and fixtures (Apr 21, p285).

EPOXY MATERIAL—*Bakelite Co, Div of Union Carbide Corp, 30 E 42 St, New York 17, NY.* Epoxy-Alloy, a new metal-fiber-reinforced epoxy composition, can be used in production of medium-run metalforming dies. Basically, an Epoxy-Alloy tool or die is a mass casting, made by a pressure process, consisting of heat-resistant epoxy system reinforced with metal or glass fibers (Feb 24, p156).

TOOLING PLASTIC—*Furane Plastics, Inc, 4516 Brazil St, Los Angeles 39, Calif.* Epocast 11B can be used in severe metal-forming operations. It is semi-resilient, has extreme toughness, and is often used to face steel dies in forming operations (Apr 21, p287).

ALUMINUM COATING PROCESS—*Upton Electric Furnace Co, Inc, 150 Grand Ave, Mt Clemens, Mich.* New process applies a coating of aluminum to steel while both metals are heated to temperatures ranging from 1300 to 1650 F. Process is accomplished in the Upton electric salt bath furnace. Depth of aluminum ranges from 0.003 to 0.010 in., depending on requirements. Depth is controlled by varying furnace temperature (Mar 24, p150).

CHROMALLIZING PROCESS—*Chromalloy Corp, 450 Tarrytown Rd, White Plains, NY.* Process, which creates on ferrous parts an integral alloy surface rich in chromium and highly resistant to chemical and high temperature corrosion, has been modified to apply to high nickel and high cobalt alloys used in jet and internal combustion engines and gas turbines. The "SA" Chromalloy process, although differing from standard treatment (AM—Nov 18 '57, p162), is also a metal diffusion process (Jan 13, p158).

CHROMALLIZING PROCESS—*Chromalloy Corp, 450 Tarrytown Rd, White Plains, NY.* Chromalloy W-2 process permits molybdenum to be utilized at working temperatures in excess of 2000 F. This process, like the company's standard Chromalloy process, involves a diffusion of chromium into the surface, providing molybdenum with a high degree of oxidation resistance (Mar 24, p152).

BONDING PROCESS — *Aluminum Company of America, Pittsburgh 19, Penna.* New bonding process, termed pressure bonding, can be used to join aluminum and stainless steel. It also offers possibilties for the use of aluminum in combination with carbon and alloy steels, copper, and other aluminum alloys. Also under development is the pressure-bonding of relatively low-strength aluminum bearing alloys to high-strength aluminum castings and forgings (Sep 8, p129).

PLASTIC SPRAY PROCESS—*Rand Development Corp, Cleveland, Ohio.* Spray process combines plastic, accelerator, catalyst, and glass-fiber through a portable three-barrel spray gun to build up reinforced plastic laminates. Technique holds promise for plastic tooling such as jigs and fixtures. Tool is operated by one man and is capable of depositing up to 15 lb of high-strength laminate per minute (Apr 7, p85).

interchangeable with all standard JIC cylinders

With the introduction of the ALL NEW T-J Squair Head, Tomkins-Johnson now offers industry the most complete design range of air and hydraulic cylinders. Presently available in bore diameters from 1½ to 8 inches, the T-J Squair Head is an interchangeable cylinder which produces maximum force and efficiency, with minimum pressures . . . and is also adaptable to the use of low pressure oil as the working medium. Write to The Tomkins-Johnson Co., Jackson, Michigan, for Bulletin #SQ 10-58 and complete details.

CHECK THESE 10 POINTS OF T-J SUPERIORITY

1 One Piece Piston

2 Hard Chrome Cylinder Bore and Piston Rods

3 High Tensile Steel Tie-Rods

4 Cushion Adjusting Screw, Externally Adjustable

5 New Super-Cushion for air, or Self-Aligning Master Seal for Oil (T-J Patents)

6 Solid Steel Heads and Mounting Plates Standard all Models

7 Port Design Allows Minimum Pressure Drop on Inlet or Outlet

8 Chevron Type, Self-Adjusting Rod Packing

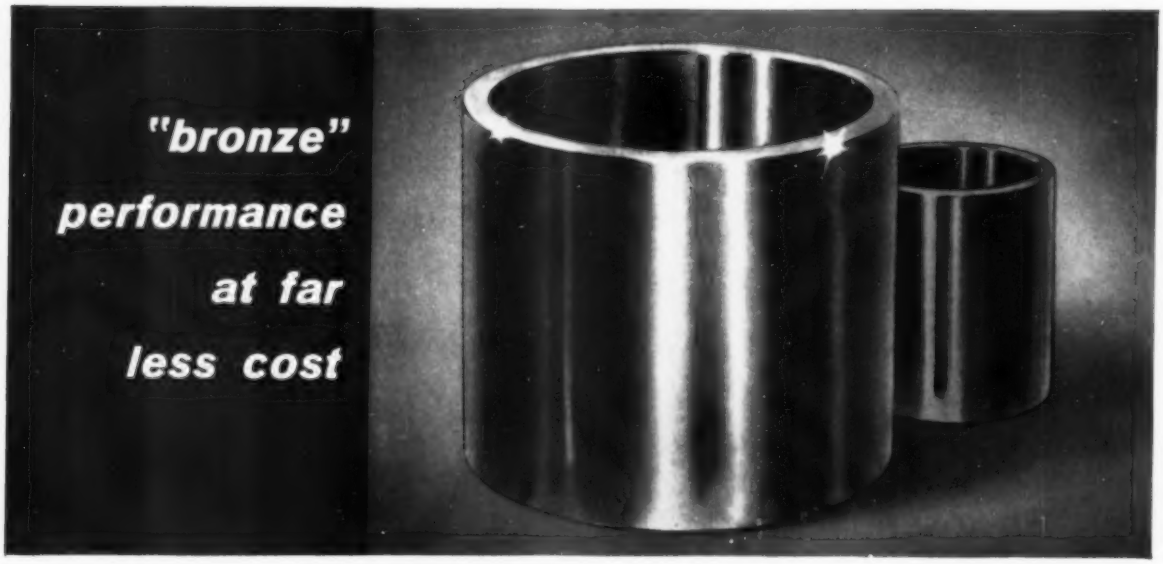
9 Piloted Packing Gland—Absolute Alignment

10 Piston Rod, Extra Strong—Polished and Chrome Plated for Efficiency and Protection

T-J TOMKINS-JOHNSON

introducing **NEW**

IRON OILITE 212 BEARINGS



The important difference between the porous bronze bearing (right) and the all-new Iron OILITE* 212 Bearing (left) is cost. While both bearings give long, maintenance-free service, Iron Oilite 212 bearings now open the door to major savings for many equipment manufacturers.

Performance-proved in life tests and on actual products, Iron Oilite 212 bearings have a service life equal to porous bronze when used for products where corrosion is not a problem and mechanical strength requirements are within tolerable limits.

A high oil content — approximately 20% by volume — assures adequate lubrication for the lifetime of many end products. In addition, a unique built-in service factor gives Iron Oilite 212 bearings extraordinary protection against temporary overloads. They perform best when carrying medium to heavy loads at relatively low speeds and readily equal the performance of bronze at the high speeds required by home appliances, fractional horsepower motors, power tools, light machinery and other products.

It's another Amplex first . . . a typical example of how Amplex serves a growing number of original equipment manufacturers with "better quality at lowest cost". Use Amplex's extensive research and engineering facilities to your own advantage. Savings can be impressive if you require bearings in volume.

free sample

of **IRON OILITE 212** Bearing 1" ID x 1¼" OD x 1" Length and full information on request. Consult the Oilite engineer in your area. Find him in the Yellow Pages under "bearings" or write direct to Amplex. Address Dept. U-1

COMPARISON OF TYPICAL PHYSICAL PROPERTIES

	Iron Oilite 212	Oilite Bronze
Porosity, % oil by volume	18 - 23	18 - 23
Ultimate Tensile Strength, (psi)	10,000	18,000
Compressive Yield Point, (psi)	9,500	20,000
Rockwell Hardness	RH - 35	RE - 65
Specific Gravity	6.1 - 6.5	6.4 - 6.7

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American Machinist

REFERENCE BOOK SHEET

How to Keep Motors Efficient

By Ernest W Fair

Closer profit margins demand greater attention to prolonging equipment life—particularly motors—and keeping maintenance costs at a minimum. By recognizing electric motor troubles, correcting them speedily, and providing adequate maintenance, you will take a long step forward toward obtaining maximum efficiency from the shop.

These are the more frequent sources of electric motor troubles, and their causes and remedies:

Bearings

If too hot to touch or smoking, you have a dry bearing, or oil rings not working, or a tight bearing.

A bearing may also be binding if the shaft has become out of true, or the bearing itself may be out of true.

Warm bearings are generally caused by an overload on the motor through heat being transferred from the rotor or the stator. In such a case we should see that either the load is decreased or a larger motor is used on the job.

Smoking windings or charred wedges over the coils mean the bearing is worn on one side. If this is discovered soon enough the bearings may be realigned or new wedges inserted to correct the trouble. If the condition is permitted to remain too long the coils will have to be replaced.

Starting Failures

When a motor fails to start a great many things may be at fault. The more prevalent causes are:

(*a*) The voltage is too low. Thus, there is insufficient torque, which calls for an increase in voltage.

(*b*) A short circuit, caused by rough handling, generally in the stator windings. The damaged coils may be replaced or the break repaired by jumping the damaged coil or coils.

(*c*) Too great a load. This calls for load reduction or the installation of a clutch between load and motor.

(*d*) Tight bearings causing friction. Journal-bearing caps can be shimmed, and if the condition continues the bearings should then be scraped.

A failure to start where automatic controls are used is generally found in the controls themselves. The general cause is that the solenoid circuit is not functioning. The arms holding circuit-breaking contacts may not be working properly, or the contacts are dirty or burned.

Buzzing sounds in the motor are generally caused by a short-circuited coil or group of coils, an open circuit, or a ground. The first named is generally due to mechanical injury or to broken-down insulation from over-heating. Install a new coil or jump the injured coil as a temporary expedient. Where the trouble is caused by a poor ground, remove it as soon as possible and reinsulate.

Low growling sounds are caused by the rotor being out of the stator magnetic center, which in turn means that the motor itself either is not level or the shaft collars have shifted and there is thus too much end play on the shaft.

Abnormal Current

When the motor starts and runs, but heats up while the stator is cool, the rotor bars are loose or grounded because of abnormal currents in the rotor. The set-screws holding the rotor bars to the short-circuiting rings should be tightened and soldered or welded and then the grounds removed.

Half-speed running on a wound-rotor motor is caused by broken connections between the windings and the collector ring, or one brush is not touching and an open circuit in the rotor connections results. The break can be repaired or weak brush spring replaced.

Causes of failure to start, in addition to those mentioned above, can be easily detected by first examining the fuses, then the relays, checking the starter carefully, inspecting the air gap and any belt pulley to find out if there is an overload.

Explosions sometimes occur in windings while a motor is running hot. These are due to dampness which causes circulating currents between the coils and between any coil and the ground and thus creates a temporary ground or short circuit. The procedure here calls for baking the motor until all dampness is gone and then brushing it with a good insulating varnish. Some times it will be found that the coils have been punctured and need replacement.

Unusual Sounds

With the starter handle in starting position, failure to start with a humming sound is a frequent trouble. The motor is trying to run single phase, an air gap is displaced, or there is an open circuit in the stator windings.

When the motor is trying to run single phase it is generally because one fuse is blown or one overload relay is out of order. This can be handled easily by adjustment of the relay or replacement of the fuse. In the second-named trouble the bearing is out of true and should be shimmed or replaced.

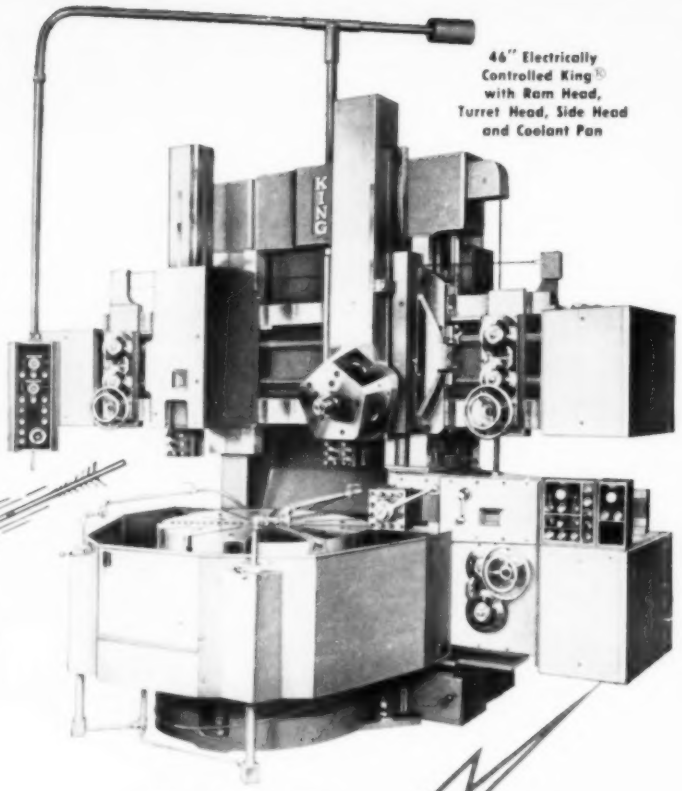
An open circuit in the stator windings is caused either by a short circuit which has punctured a coil or by rough handling. Sometimes when a motor has been repaired and replaced, it will run with an unusual sound with intervals of speed changes. Generally this is because one coil in one phase has been reversed due to wrong connections when it was replaced or reconnected.

Burned insulation, brought about by one or more coils in the stator being too hot from a short circuit, is due to mechanical injury or to broken-down insulation. This calls for just one thing—replacement of the coil. However, if the new coil is not available, the motor may be used temporarily by jumping the injured coil.

A great deal of electric motor troubles can be eliminated by making sure that the highest grade of oil is used in sleeve bearings and the best grade of grease on roller and ball bearings.

IF YOU DON'T HIT THE "BULL'S EYE"

...You Can't Win the Game!



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Full Electrically Controlled

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- **COMPLETE ELECTRICAL CONTROLS**—conveniently located on movable pendant station and machine-mounted panel.
- **INCREASED HORSEPOWER**—40 and 50 H.P. on 30", 36", and 46" sizes, 75 and 100 H.P. on sizes 56" and up—available in any one of three speed ranges.
- **EXPANDED FEED AND SPEED RANGES**—24 feeds from .0016" to .250" per revolution. 24 speeds in any one of three standard ranges—low, intermediate, or high.
- **DIALS FOR PRE-SELECTION OF FEEDS AND SPEEDS.**
- **IMPROVED SPINDLE MOUNTING**—with extra-heavy spindle, provides maximum table stability with resulting higher, uniformly maintained accuracy.
- **AUTOMATIC LUBRICATION of all moving parts.**
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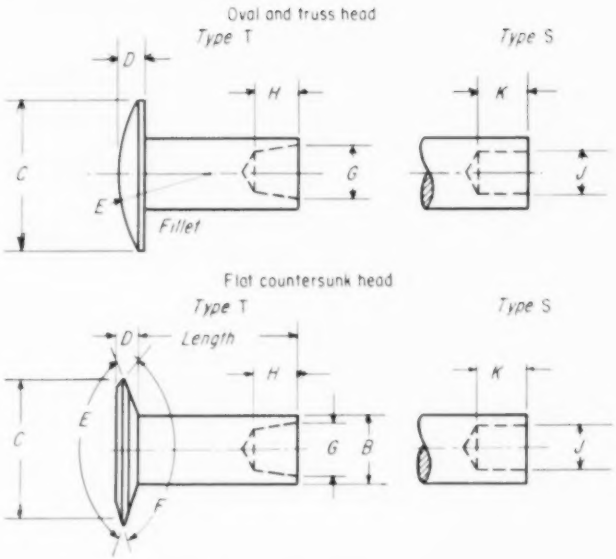
CIRCLE 188 READER SERVICE CARD

Semi-Tubular Rivets

These standards, developed by the Tubular and Split Rivet Council, cover the body diameter and head dimensions for three head styles of semi-tubular rivets. The oval-head rivet has a semi-elliptical head, whereas the truss-head rivet has a low, rounded top and its flat bearing surface is larger than that of the oval head. The flat countersunk head has a flat top and a conical bearing surface of 150°.

Semi-tubular rivets are made of low-carbon steel (0.1% carbon or less), commercial yellow brass, and from other materials as agreed upon, including copper and aluminum.



Dimensions of Semi-Tubular Rivets

B*	C	D	E	Type-T G	Type-T H	Type-S J	Type-S K
Oval Head							
0.058-0.061	0.109	0.017	5/32	0.044	3/64	0.041	3/64
0.085-0.089	0.147	0.023	7/32	0.067	1/16	0.064	1/16
0.095-0.099	0.187	0.029	17/64	0.074	1/16	0.072	5/64
0.118-0.123	0.218	0.034	5/16	0.093	5/64	0.086	3/32
0.141-0.146	0.234	0.040	17/64	0.109	7/64	0.102	1/8
0.182-0.188	0.312	0.060	1/4	0.142	9/64	0.136	5/32
0.210-0.217	0.437	0.068	5/8	0.162	5/32	0.157	3/16
0.244-0.252	0.500	0.078	23/32	0.186	3/16	0.178	7/32
0.302-0.310	0.562	0.093	11/16	0.230	7/32	0.213	1/4
Truss Head							
0.058-0.061	0.125	0.017	1/8	0.044	3/64	0.041	3/64
0.085-0.089	0.187	0.023	7/32	0.067	1/16	0.064	1/16
0.118-0.123	0.281	0.034	3/8	0.093	5/64	0.086	3/32
0.141-0.146	0.312	0.040	29/64	0.109	7/64	0.102	1/8
0.182-0.188	0.375	0.060	17/32	0.142	9/64	0.136	5/32
Flat Countersunk Head							
0.118-0.123	0.250	0.034	†	0.093	5/64	0.086	3/32
0.141-0.146	0.296	0.040	†	0.109	7/64	0.102	1/8
0.182-0.188	0.359	0.046	†	0.142	9/64	0.136	5/32
0.244-0.252	0.468	0.060	†	0.186	3/16	0.178	7/32
Large Flat Countersunk Head							
0.141-0.146	0.359	0.046	†	0.109	7/64	0.102	1/8
0.182-0.188	0.468	0.063	†	0.142	9/64	0.136	5/32

* The upper limit is the nominal diameter.
† Included angle E under the head = 150°, and the included angle F of bevel on top of the head = 136°.

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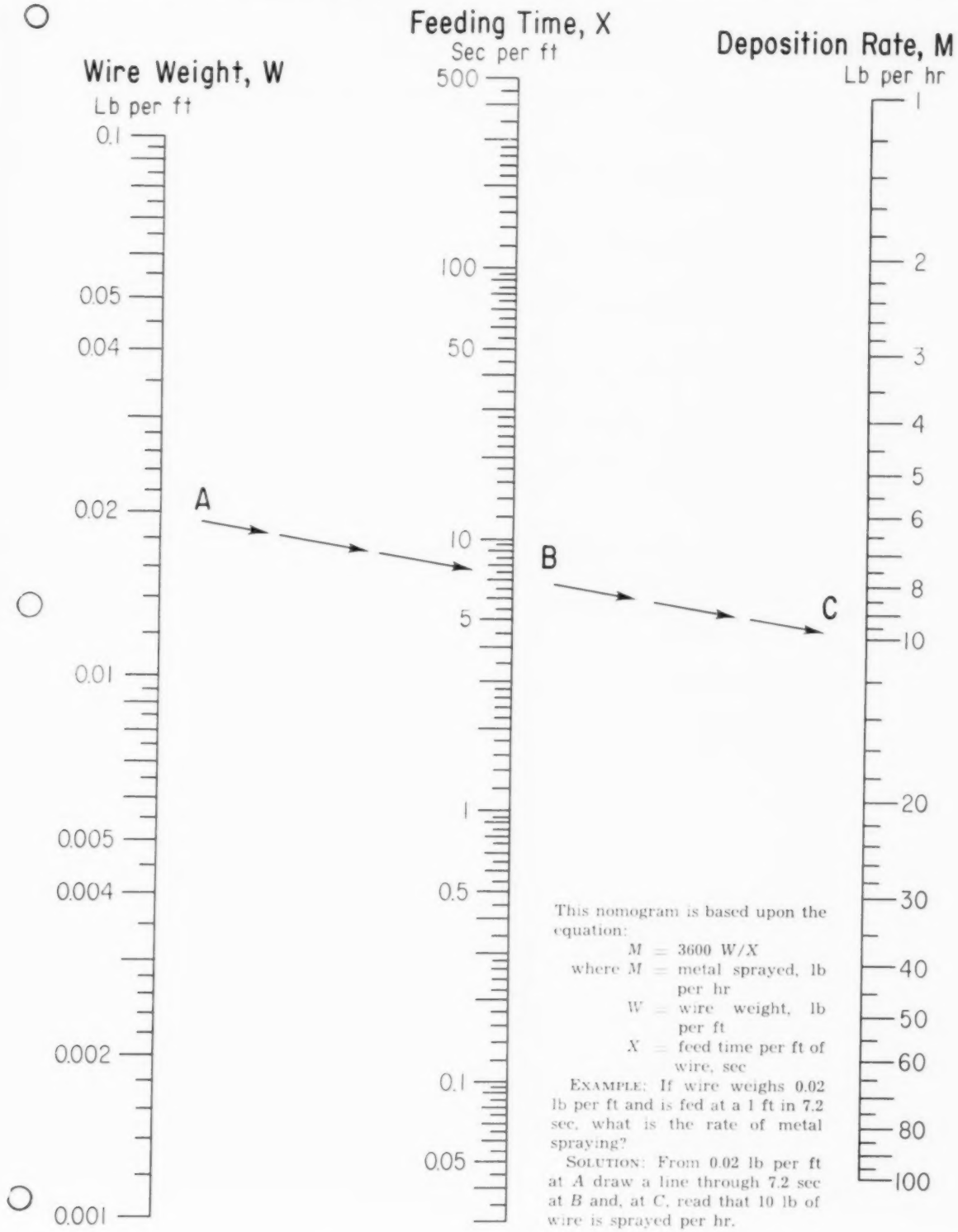
American Machinist
REFERENCE BOOK SHEET

Metal-Spraying Estimates

By Tyler G Hicks, mechanical engineer



This nomogram is based upon the equation:

$$M = 3600\ W/X$$

where M = metal sprayed, lb per hr
W = wire weight, lb per ft
X = feed time per ft of wire, sec

EXAMPLE: If wire weighs 0.02 lb per ft and is fed at a 1 ft in 7.2 sec, what is the rate of metal spraying?

SOLUTION: From 0.02 lb per ft at *A* draw a line through 7.2 sec at *B* and, at *C*, read that 10 lb of wire is sprayed per hr.

From ROUGH BLANK to FINISHED GEAR *In 5 Seconds*

How? a New Red Ring Broaching Process

ACCURACY:

Pin size to .0009″

Lead to .0008″

Involute error .0003″

Composite error less than .001″

FLOOR–FLOOR: 15 Seconds

CHARACTERISTICS: 87 teeth, 24 pitch, 22° helix, 4″ O.D., $\frac{3}{4}$″ face—cast iron.

TOOL LIFE: After broaching 26,000 parts, this broach was resharpened by the removal of only .010″ of metal. In other cases, production would be governed by operating conditions.

REPLACES SIX HOBBING MACHINES

8168

The above are actual production figures showing the possibilities of this amazingly effective broaching process.

The consistent precision and speed attained do not depend on the operator. They are engineered into the tooling.

Investigate the savings of this process as applied to your operations. Get the whole story from a Red Ring engineer.

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A-B Reliable Control Units

for every industrial application

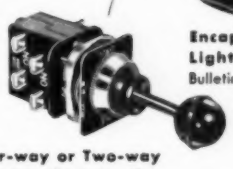
Among the many hundreds of Allen-Bradley push button and control units, you are certain to find the types best suited to your particular needs. The seven units shown below are a few of the latest additions to the Allen-Bradley *quality* line of control units.

All Allen-Bradley control units—standard duty, heavy duty, and oiltight—have double break, silver alloy contacts—to assure reliable operation. Simple constructions and generous wiring room are outstanding features. Insist on Allen-Bradley control units for *all* of your equipment—you can't go wrong!

NEW

Illuminated Push Button. Combines pilot light and push button in one unit. Oiltight Bulletin 800T.

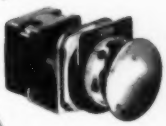
Push-to-Test Pilot Light. Oiltight Bulletin 800T.



Four-way or Two-way Selector Switch. Oiltight Bulletin 800T.

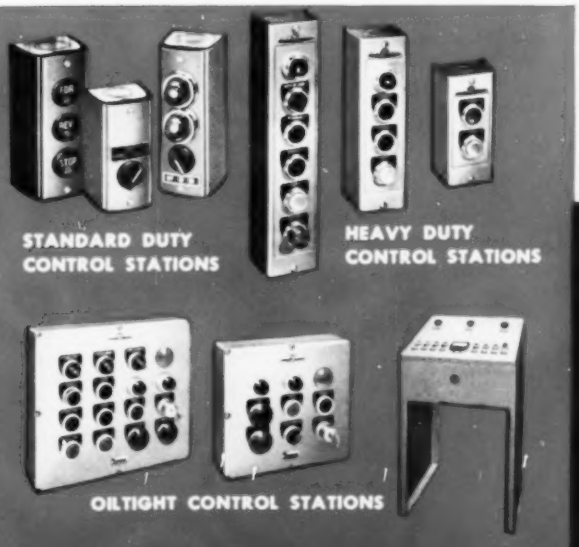
Encapsulated Pilot Light. Heavy Duty Bulletin 800.

Encapsulated Pilot Light. Oiltight Bulletin 800T.



Time Delay Push Button. Delay is adjustable from 0.5 second to 5 seconds. Oiltight Bulletin 800T.

Double Circuit Push Button. Has 2 N.O. or 2 N.C. contacts. Oiltight Bulletin 800T.



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1-59-MR

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MOTOR CONTROL
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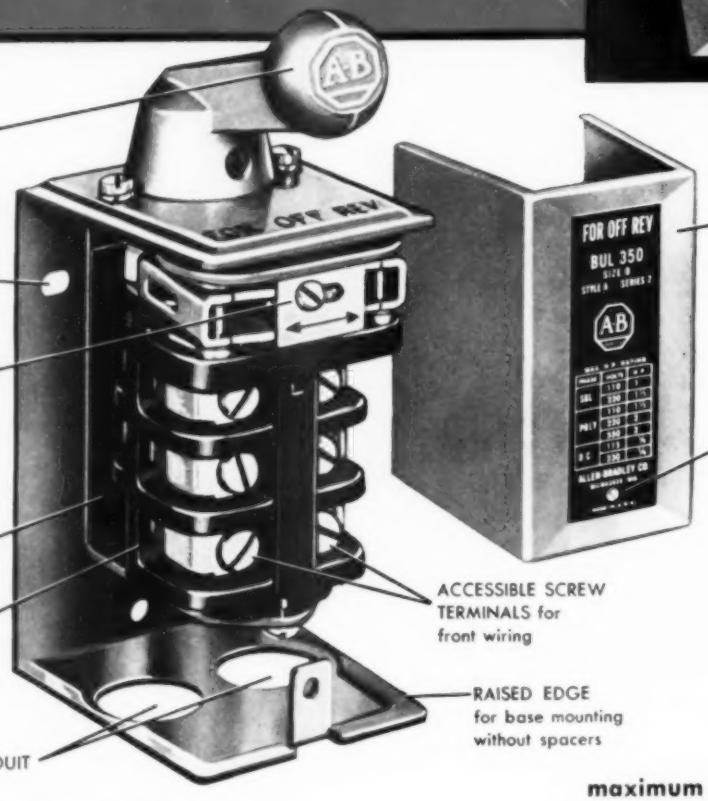
Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada: Allen-Bradley Canada Ltd., Galt, Ont.

A new "quality" standard for small REVERSING DRUM SWITCHES



GOOD-LOOKING AND GOOD "FEELING" DIE CAST HANDLE

EASILY ACCESSIBLE MOUNTING HOLES

MERELY LOOSEN SCREW AND SLIDE PLATE to change from momentary to maintained contacts —or vice versa

INDEPENDENT SWITCH MOUNTING prevents misalignment

HEAVY CONTACT SURFACES for long operating life

TWO CONDUIT OPENINGS

WRAP-AROUND COVER gives complete access to drum

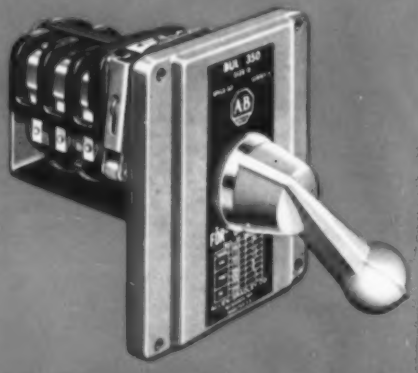
SINGLE SCREW COVER MOUNTING —screw cannot fall out

ACCESSIBLE SCREW TERMINALS for front wiring

RAISED EDGE for base mounting without spacers

maximum rating 2 horsepower

NEW OILTIGHT COVER PLATE FOR CAVITY MOUNTING



Bulletin 350 Reversing Switch can be furnished with oiltight cover plate with rubber gasket seal for cavity mounting in a machine base.

This *all-new* Allen-Bradley reversing drum switch was designed to keep pace with the mechanical beauty designed into so many of the modern machine tools.

The Bulletin 350 reversing switch is equivalent to a three-pole, double throw switch . . . and can be used with d-c motors; or single phase, two phase, or three phase a-c motors.

Investigate the Bulletin 350 . . . the *new leader* of its class . . . in appearance, ease of installation, and operating life. An Allen-Bradley *quality* switch . . . in every sense of the word. Send for descriptive bulletin.

ALLEN-BRADLEY

MOTOR CONTROL

QUALITY

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

1-59-MR

Shall we buy numerical control?

This question will be asked more frequently this year than ever before. Here are some of the key considerations, by a man who has been closely associated with numerical control for a number of years.

By M C Copold,
numerical control coordinator
Convair—San Diego, a division of General Dynamics Corp

Experience indicates that numerical control unquestionably represents a tremendous immediate and potential saving to the aircraft industry. The complexity and tolerance requirements for the production of large structural parts is, in many instances, beyond our competence to produce them economically, without benefit of numerical control. To solve these problems, numerical control is not, and will not be, used primarily for economy of cost, but more surely to accomplish the task which is almost beyond the normal human potential to perform within a reasonable time span. General areas of potential economic gain may be found in:

1. Greater freedom in engineering design
2. Reduced tooling and maintenance costs
3. Maximum production realization
4. Consistently high-quality parts
5. Reduced scrap
6. Reduced lead time
7. Absolute interchangeability and exact duplication of parts
8. Minimum tool-storage requirements
9. Elimination of elapsed time and tooling coordination in case of mobilization
10. Machine tool versatility

To obtain the greatest benefit, the application of numerical control to machine tools for aircraft production must be carefully weighed to determine whether or not it is being properly applied to the job for which it is being considered.

Criteria Involved

In determining whether numerical control should or should not be applied, the criteria involved are:

1. Careful consideration of the machine tool, to determine its complexity of operation. This is primarily done to determine whether economical operation of the machine is possible by human beings, or only by the introduction of aids such as templets or numerical control.

2. The material from which the part is to be made on the machine, its cost and availability to determine whether or not it is economically feasible to have an operator making the decisions of fabrication.

3. The tolerances required in the final fabrication of the part to determine whether it is humanly possible to attain, consistently, these tolerances by means of operators.

Types of Control

Three types of control may be applied to the operation of machine tools. First, the simple control of having a human being stationed at a machine and operating directly from a blueprint or an operation sheet. Second, the cam or templet control, whereby the human being is assisted by a pre-fabricated templet in the operation of the machine. Third, numerical control, whereby the machine is operated by a tape, containing a program for operating the machine, and requiring only a bare minimum of human directional intervention.

Thus, by correlating these factors, ideal operation of a machine by a human operator would call for:

1. Low speeds
2. Simplicity, meaning a minimum number of simultaneous axial movements of the machine tool
3. Low production requirements
4. A minimum of accessories
5. A low-cost material for parts, if high production output is required
6. Large tolerances

All of these conditions lend themselves to making human control the most economical facet of production.

By introducing a cam or templet, we find:

1. Higher speeds are possible.
2. We are still restricted to simplicity, with a minimum number of simultaneous operating axes of the machine tool, because of the tolerances involved in templet production and correlation.
3. Higher production requirements are possible, if we restrict the machine to a minimum of accessories for control by the operator.
4. More expensive material can be used to make the parts, because the man has been relieved of some of his operational responsibility.
5. Once the templets are properly coordinated, we can expect to get reasonably close tolerances.

However, by introducing numerical control, it is economically possible to get:

1. High speed
2. Full utilization of the most complex machine tools, with a maximum of simultaneous axial operation
3. Higher production requirements
4. Unlimited use of automatic accessory controls
5. Economical use of the more expensive materials, because the decisions required for operating the machine have been transferred from the operator to the tape
6. Tolerances consistently up to the limit of the machine capability.

To be sure that an established utilization rate can be maintained, it is most essential to establish that numerical control in each case has been properly applied. Careful selection, by providing maximum production realization, should enable the user to amortize his equipment within a compatible time span, even as it might be related to the amortization of his more conventional equipment. No investment is sound that operates at a loss, no matter how wonderful the equipment may seem.

What Other Benefits?

Other areas of potential economical gain should be sought out and exploited to the greatest extent. Product design and engineering are given much greater freedom in product concept, because of the expanded operational character and versatility of numerically controlled machine tools. Designers are able to create parts previously considered uneconomical in production. Therefore, it is especially important that the design engineer in any company be thoroughly familiarized with these tools, and with their potential.

Tooling can be reduced because numerically controlled machine tools lend themselves to more simplified tooling concepts. Numerical control virtually eliminates hand-made operating templets and tooling tools (the latter of which are normally a hidden-cost factor in the regularly

(Continued on page 244)

GREATER ACCURACY...

Your most effective Profit-Builder

The products that sell most successfully in today's competitive markets – and build the biggest profits for their manufacturers – are those most capable of meeting today's higher standards for quality and performance. And because greater accuracy is the sure, economical way to increase product quality and performance, precision properly applied can be your most effective profit-building tool.

Therefore, the continued use of machine tools designed for yesterday's standards of accuracy is poor economy today. That's why manufacturers are finding that the superior accuracy made possible by Pratt & Whitney Machine Tools means more accurate components, fewer rejects . . . and products that perform better, win wider acceptance and build bigger profits.

NUMERICAL CONTROL . . . Puts Toolroom Precision into Production

Pratt & Whitney conducts an intensive program of research and development that is making it possible to combine toolroom standards of accuracy with production-line speed, efficiency and economy.

One of the most outstanding recent developments produced by this program is Numerically-Controlled equipment. Applied to P&W Jig Borers, Rotary Tables and other Machine Tools, numerical control eliminates human error and makes it possible to produce jobs calling for "tenths" precision *as fast* as work calling for "thousandths" limits. Output is greatly increased, and the extreme accuracy of these machines can be applied efficiently to production work. Most important – with more time spent in actual machining and less time spent in reading and interpreting blueprints, manually positioning the machine, checking settings and other non-productive operations – *machine utilization efficiency is more than doubled!*

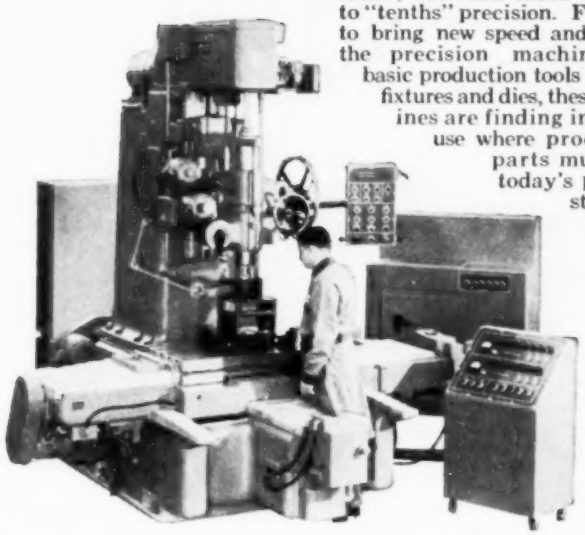
PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

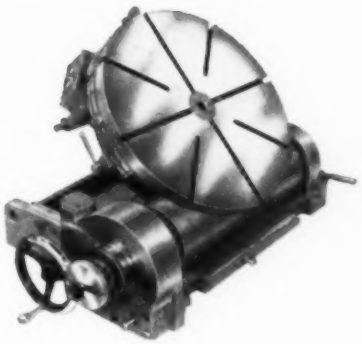
P&W JIG BORERS . . .

locate, bore and check accurate to "tenths" precision. First used to bring new speed and ease to the precision machining of basic production tools like jigs, fixtures and dies, these machines are finding increasing use where production parts must meet today's precision standards.



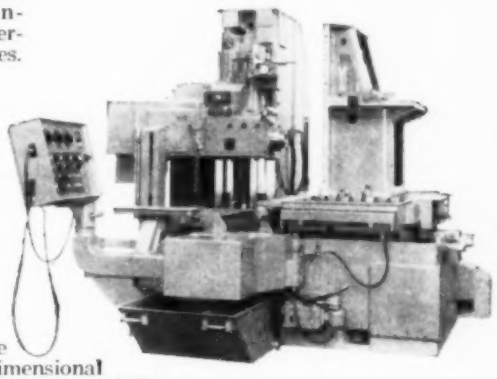
P&W PRECISION ROTARY TABLES . . .

make it possible to combine lower production costs with increased accuracy where machining requires circular spacing or angular positioning. Also used for inspecting or graduating, these P&W Tables combine rugged construction with accuracy to *seconds of arc!* Produced in a complete line, that includes horizontal, vertical and tilting types.



P&W KELLER MACHINES . . .

are automatic, tracer-controlled millers that accurately reproduce the shape of any 2-dimensional template or 3-dimensional model. The ideal machine for fast, economical production of dies, molds and prototypes, P&W Kellers are now finding extensive use for production work.



Other Pratt & Whitney Machine Tools

VERTICAL PRECISION HOLE GRINDER

"Tenths" accuracy plus grinding speeds to 100,000 rpm.

"VELVETRACE" MILLING MACHINE

Ultimate in accuracy for 3-dimensional tracer-controlled reproduction.

MAGNESPARK VERTICAL PROFILERS

A new concept in tracer control for automatic 360° profiling.

AUTOMATIC DUPLICATING MACHINES

Duplicate dies and molds quickly, accurately and economically.

CUTTER and RADIUS GRINDERS

Grind practically every type of standard and special cutter . . . quickly, accurately.

VERTICAL SHAPERS

Handiest machines in any shop for fast, accurate handling of irregular shaped work.

MODEL C THREAD MILLERS

Unusually versatile; set new standards for accuracy, finish and economy.

DEEP HOLE DRILLERS

Twin drilling units produce true holes up to 129" deep in a single, uninterrupted operation.

Free Literature . . . on all P&W Machine Tools is available. No obligation. Write on your company letterhead, and ask for Circular 605-1.

PRATT & WHITNEY COMPANY, INCORPORATED

11 Charter Oak Boulevard, West Hartford, Connecticut

Branch Offices in the following cities:

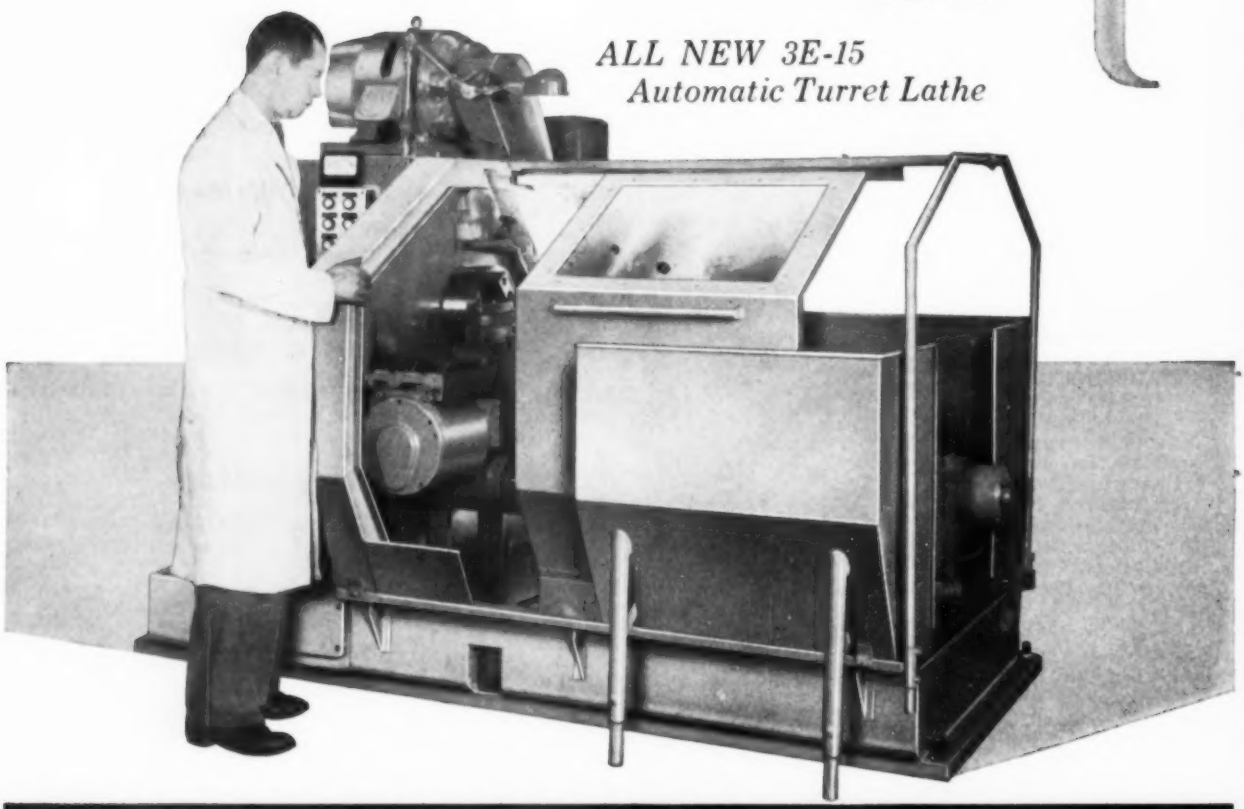
BIRMINGHAM, ALA., BOSTON, MASS., CHARLOTTE, N. C., CHICAGO, ILL., CINCINNATI, OHIO, CLEVELAND, OHIO, DENVER, COLO., DETROIT, MICH., JUPITER, FLA., LIVINGSTON, N. J., LOS ANGELES, CALIF., MILWAUKEE, WISC., NEW YORK, N. Y., PHILADELPHIA, PENNA., PITTSBURGH, PENNA., ROCHESTER, N. Y., ST. LOUIS, MO., SAN FRANCISCO, CALIF., SYRACUSE, N.Y., WEST HARTFORD, CONN.

Representatives in the following cities:

DALLAS, TEX., HOUSTON, TEX.

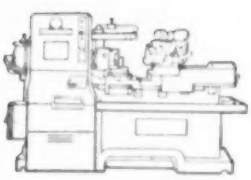
"CUT Machining Time 45% and INCREASED PRODUCTION 45%"

ALL NEW 3E-15
Automatic Turret Lathe

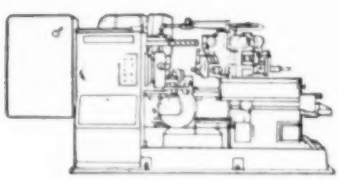


FROM THE COMPACT, HIGH-SPEED 3-U, with 6" chuck

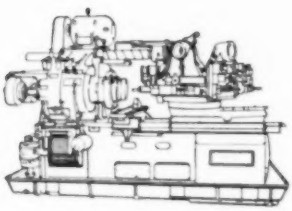
3-U SPEED-FLEX



4-U AUTOMATIC



5-D POWER-FLEX



POTTER & JOHNSTON AUTOMATICS ARE AVAILABLE IN A COMPLETE

This Statement comes from a manufacturer who recently replaced his old, inefficient hand operated machines with new Potter & Johnston Automatic Turret Lathes. Reports from some of the many other manufacturers who have replaced with P&J include statements like these: "We reduced machine-hours 71%" . . . "Our company eliminated 4 machines and reduced operating costs" . . . "P&J Machines helped us save 66% in labor costs" . . . "We cut machining time in half and eliminated inaccuracies!" And remember – this is the kind of cost-cutting, time-saving performance *you* can expect in your plant when you replace with Potter & Johnston Automatics!

P&J Automatics deliver profit-building performance like this, because they incorporate every design advance and construction detail that can help you produce faster at lower cost. For example, the new 3E-15 shown here offers you: Extra power and rigidity for faster, more accurate metal removal . . . selector-switch cross slide control, independent turret indexing drive, extra-large control drum and 6-face turret for faster, easier set-up and maximum tooling flexibility.

Tape Control. Where the ultimate in productivity and flexibility is desired – P&J Automatics can now be equipped with Tape Control for all machine motions. This important advance in industrial production methods greatly reduces setup time and insures optimum programming and cycling with minimum floor-to-floor time. All your jobs can be handled with greater efficiency . . . the cost-cutting advantages of fully automatic operation are made available for very short as well as long production runs.

Send Now for the Facts . . .

that will prove how P&J Automatics can help you speed production, improve work quality and reduce costs. Write for your free copies of P&J Case-History Reports . . . or ask to have a Representative visit your plant and analyze your requirements. There's no obligation, of course. Potter & Johnston Company, Pawtucket, Rhode Island.

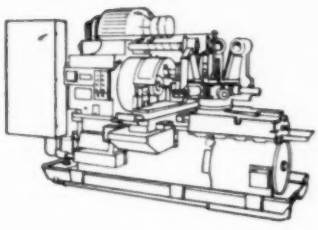
POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

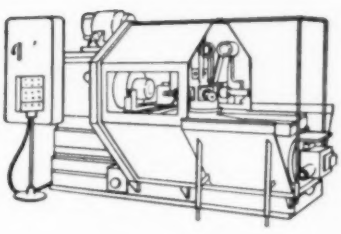
PRECISION PRODUCTION TOOLING SINCE 1898

. . . TO THE GIANT 10-U, with chuck sizes to 42"

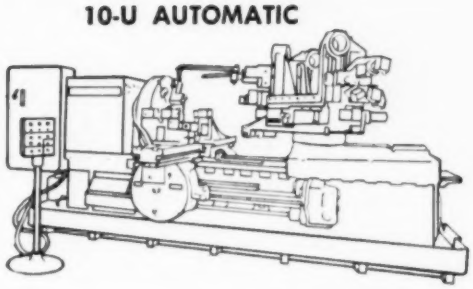
6-D AUTOMATIC



8-U AUTOMATIC



10-U AUTOMATIC



LINE TO HANDLE EVERY JOB FASTER AND BETTER AT LOWER COST!

Atrax PROGRESS REPORT

SOLID CARBIDE TOOLS

CASE HISTORY #19
MAJOR AUTOMOBILE MANUFACTURER

Atrax
BORING TOOL
Series 2010

OPERATION — Boring 20 holes around 4½" O.D. x 3" I.D. Stator Blade Rings
MATERIAL — Cast Iron
SPEED-FEED — 8,000 r.p.m. at 10" per min. stock removal .014"
PRODUCTION — 10,000 holes per grind. Use of this Atrax tool reduced number of special machines needed to maintain production from 18 to 6.

CASE HISTORY #30
MID-WEST PUMP MANUFACTURER

Atrax
SOLID CARBIDE BUR
Shape A-184

OPERATION — Plunge cut to ¼" depth using milling machine
MATERIAL — Beryllium Copper
SPEED-FEED — Slow speed-hand fed
PRODUCTION — Extremely fine surface finish resulted with virtually no wear on Atrax Solid Carbide Bur.

CASE HISTORY #31
EASTERN AIRCRAFT MANUFACTURER

Atrax
END MILL
Series 1505
(Slow Spiral)

OPERATION — Reworking and salvaging hardened dies and fixtures for retooling program
MATERIAL — Hardened steel Rockwell C-58 and case hardened materials
SPEED — 1200 r.p.m. with hand feed
PRODUCTION — Atrax Solid Carbide Slow Spiral End Mills used on this rework and salvaging application proved extremely successful in time and material savings.

Atrax

SEND TODAY for 96 page "STANDARD REFERENCE" on Carbide Tooling!

THE ATRAX COMPANY
Newington 11, Connecticut

accepted tooling project). All of these items tend to lower the time span required for a production cycle in its entirety, from the engineering drawing to the finished part. Reduction of the number of tools, in a family of tools, will also result in a reduced tool-maintenance cost—one factor which all tooling people will recognize as a major share of their operating money.

Numerical control makes possible maximum production realization because the human factor is reduced as a directing force. Hence, the operating cycle can be established as an accurately calculated time span. Industrial engineers can better determine the character and size requirement of production flow through the machine shop, and establish the required tool and machine-tool count by actual calculation, rather than by educated guess.

Normal manufacturing requires accurate and intelligent inspection of parts at great expense, to maintain a good production flow. Numerical control enables its user to consistently produce parts of the highest quality, with only a minimum of inspection required per part. Because numerically controlled machines are operated from prepared programs on a tape, dimensional control is pre-established. As a result, the manufacture of scrap, by operator error, is minimized.

Numerical control will operate a machine tool to the highest limits of its tolerances, thereby producing very close tolerances in the part. Greater accuracy means reduced weight, excellent interchangeability

(continued on page 248)

There's a BIG DIFFERENCE in AIR FRICTION CLUTCHES

THE MINSTER CLUTCH IS MORE EFFICIENT

MINSTER® PRESS USERS *Always Get Maximum Clutch Performance and Longest Clutch Life*

It's not unusual for the clutch and brake on a Minster press **to perform, shift after shift, on rapid single cycle operation for eight, ten or twelve years without ever being disassembled for relining.**

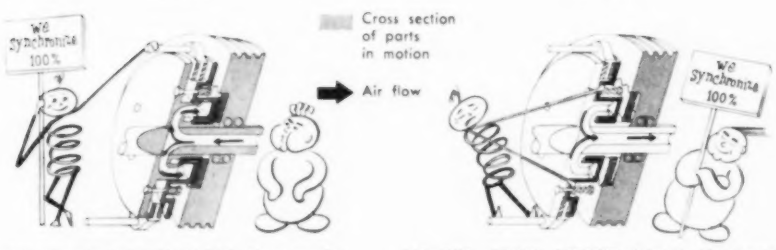
Users of all types and sizes of Minster presses consistently get that kind of service from the Minster patented Combination Air Friction Clutch and Brake.

Improvements in the design of the Minster clutch are being made continuously by Minster, **the press builder that developed and pioneered the air friction clutch for presses.** Performance records prove that, with a Minster clutch, the length of service and operational value is there.

Next time you're evaluating press equipment or considering a press clutch conversion, bear in mind, all air friction clutches are *not* alike.

THE MINSTER MACHINE COMPANY, MINSTER, OHIO

RUN **STOP**



AIR IN—CLUTCH ENGAGED—(brake off) AIR OUT—BRAKE APPLIED—(clutch disengaged)

Compare the number of parts . . .

The Minster Combination Air Friction Clutch and Brake is one synchronized unit with one moving member engaging the clutch by air pressure in one direction and applying the brake in the opposite direction as air exhausts. Movement from full brake to complete engagement is the absolute minimum, assuring fast action at any speed for quick, controlled stopping.

How

RYKO

In just two years since introduction, **RYKON** Grease has stepped in to deliver lubrication in hundreds of applications where other greases have failed

The reason RYKON Grease can perform under conditions that cause other greases to fail is this: RYKON Grease has a unique non-soap, organic thickener. This thickener holds the oil between its fibers better than any other gelling agent. The thickener is able to withstand extremely high as well as low temperatures. It resists chemical action and remains stable under conditions of severe working and water washing. RYKON Grease has exceptional anti-rust properties.

RYKON Grease's unique properties make it truly multi-purpose. This leads to many worthwhile economies. With one grease to do possibly every grease lubrication job in a plant, there's no chance for application mistakes. Inventory and handling of many single-purpose greases is reduced or eliminated. Maintenance training and supervisory follow-up is greatly reduced.

More facts about RYKON Grease are yours for the asking. Call the lubrication specialist in your nearby Standard Oil office in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

CIRCLE 199 READER SERVICE CARD

N GREASE

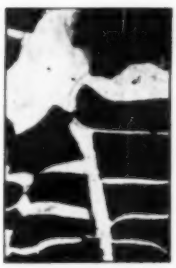
High temperature test for grease. Grease samples are spread on metal strips and placed in 350° F. oven for five days. Only RYKON Grease remained workable at end of test.

has performed in ten tough applications

1

2

3



In the metalworking industry, where higher speeds, loads, temperatures and pressures are being put on bearings as a means of increasing productivity of equipment, a new type of grease has been needed. RYKON is that grease. Here are just 10 examples of how RYKON Grease has performed in tough spots:

Industry	Equipment	Type of Bearings	Conditions	Remarks
Steel Mill	various	plain and anti-friction	high temperature, heavy load, water, dirt	Outperforms all previously used greases. Less consumption, fewer bearing failures.
Steel Mill	tin line	plain and roller	high temperature, water	Hot caustic water caused other greases to run out and form deposits. RYKON lasts twice as long.
Metalworking	bearings over molten pot	—	high temperature	Temperature reaches 500° F. at times. RYKON stays in longer.
Steel Mill	pit crane, floor crane, charging car	plain and anti-friction	high temperature	Lasts twice as long as some other greases used.
Metalworking	drill head multi-spindle	anti-friction	heavy load	Other greases failed. Running cool on RYKON. No leakage.
Auto Manufacturer	switches on machine tools	—	wet	Good water protection and dielectric strength at a lower cost than previously
Die Caster	die cast machines	various	high temperature	Cut down wear considerably.
Bearing Manufacturer	high speed spindle bearings	anti-friction	high temperature, heavy load	Lasts twice as long as a high priced bearing grease. Does not darken or form varnish.
Steel Fabricator	core oven conveyer	pulley bearings	high temperature and dirt	Works where other greases ran out. RYKON best ever used.
Steel Fabricator	oven conveyer	ball	high temperature	All previous greases caused trolley bearings to stick. RYKON solved problem.

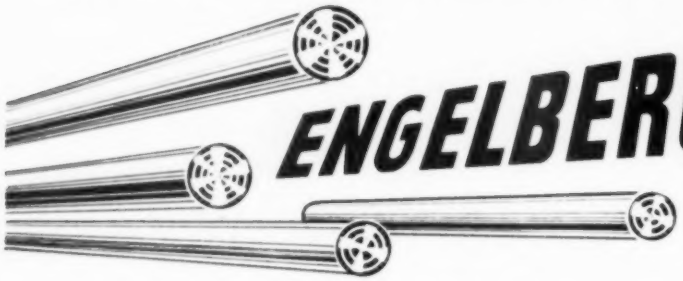
Oven test shows high temperature performance of RYKON Grease. 1. Metal panel coated with RYKON and placed in oven at 350° F. 2. Same panel after five days. RYKON is still soft and ready to lubricate. 3. Another high-melt grease ready for same test. 4. Same panel after oven test Grease has failed completely.

You expect more from **STANDARD** *and you get it!*

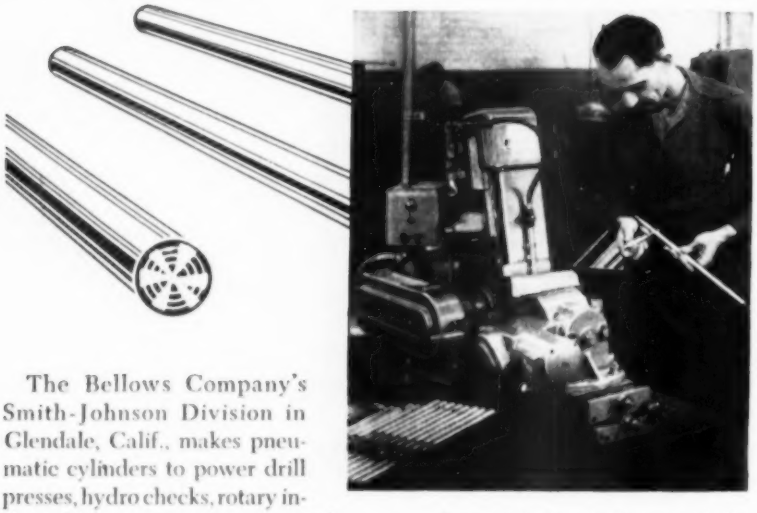
CIRCLE 200 READER SERVICE CARD

PNEUMATIC CYLINDER PISTON RODS

GROUND TO .0005" TOLERANCE WITH . . .



CENTERLESS BELT GRINDER



The Bellows Company's Smith-Johnson Division in Glendale, Calif., makes pneumatic cylinders to power drill presses, hydro checks, rotary index tables, etc. To achieve smooth, steady action even with low air pressure, the piston rods are precision sized to tolerances of .0005" and surface finished to 8 microinches on an Engelberg Model L-4 Centerless Belt Grinder.

With this Engelberg Grinder parts are through-fed at 84" per minute, average belt life is 1200 production feet, and belt changes take less than a minute. The result – a 300% production increase.

Abrasive belt grinding can help you solve your surfacing and finishing problems. This technique is now recognized as one of the most rapid, economical and versatile for stock removal, precision sizing and fine finishing of almost any material. Engelberg Methods Engineers will welcome the opportunity to study your problem. Just send us drawings or typical pieces for operational analysis.

FREE! Booklet of 33 case histories showing how Engelberg Abrasive Belt Grinders helped to solve production problems in many industries. Send for your copy today.

ENGELBERG, INC.

Precision ABRASIVE BELT GRINDERS

181 SENECA STREET, SYRACUSE 4, NEW YORK

and simplified assembly. All of the aforementioned factors are essential, as all of their benefits result in sizably reducing what is often classified as "fatal lead time." In addition, numerical control minimizes tool-storage area requirements.

Numerical control lends itself to the introduction of engineering changes, which in our business, is almost a "must." As we, in a sense, are custom builders rather than mass producers, this then reduces the production cycle elapsed time and tooling coordination, which could be a serious detriment to our work, especially in a national emergency. And last, but not least, we should consider in these economic advantages the natural versatility which is lent to any of these tools merely by adopting numerical control.

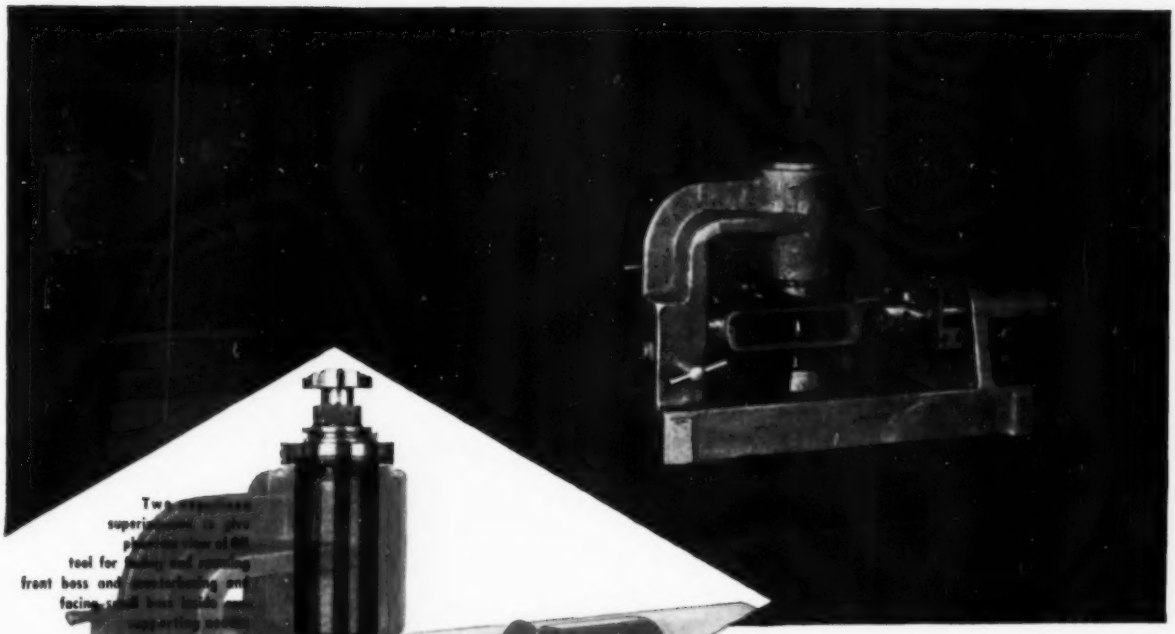
Numerical control, without the benefit of great experience prior to its application, has demonstrated tremendous potential economic feasibility. Actual tests and calculations have proved . . .

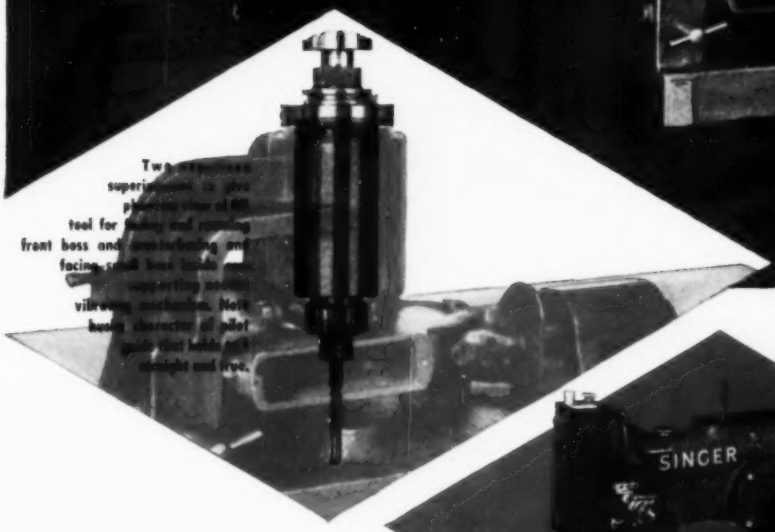
. . . In one case, aircraft parts of varied configurations were so reduced in cost that the tape preparation cost was amortized after running fewer than five parts of a single design.

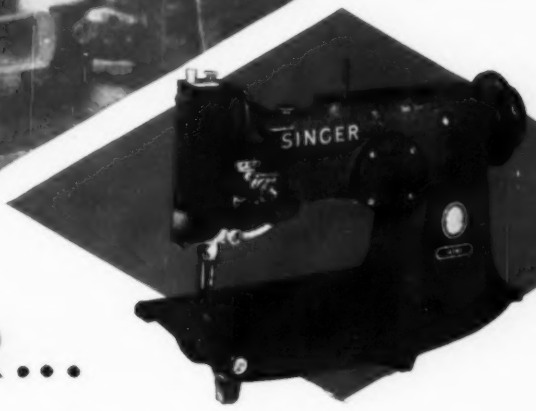
. . . Further actual tests indicate that the total production costs were absorbed in from seven to 20 pieces, depending upon the complexity of the configuration of the part involved, as compared to the conventional or actual methods formerly used for equal lots of 10 through 30 pieces.

A projected study of numerically controlled automatic cycling indicates that, on quantity production, operating costs can be reduced by a ratio of five to one. Consequently reduction of comparable labor costs indicates an 80% dollar saving gained over the former semi-mechanical method of production.

Management, in its acceptance of numerical control, can look forward to qualimatically (defined as the improved product quality resulting from a piece being built by automatic controls) controlled machine parts and near optimum machine production rates. This situation can prevail while operating at minimum production, or up to a point of maximum production. By this method, floor-to-floor time can be reduced from approximately 30 to 80% by transferring and storing the machine-operator's skill to the tape, as these skills are basically machine







Singer Sewing Machines, Class 143W, are ... industry for over stitching ... binding awnings, ... goods and foundation garments, shoe linings, ... shades and ... lace, applique, flag stars, etc.

at SINGER...

four operations with one stroke...+

JOB DATA

Operating speed... 145 rpm

Feed... .013 feet per revolution

Depth of cut... facing, 3/32" reaming, 3/8"

Before Singer acquired these OK two-step piloted reaming and facing tools, downtime ran high. After 300 pieces, tools were out for grinding. Now they get 750 pieces before grinding, an increase of 150 per cent. One man works two spindles, producing 50 units per hour without pushing and maintains tolerances plus and minus .001". Workpiece is a sand molded grey iron casting, not the easiest material to machine. This is one of dozens and dozens of high speed steel and carbide bladed multiple-diameter tools OK has made for Singer. OK tool designing and engineering service is free and it's fast. If you have a tooling problem, why not talk to us about it. Just send us a blueprint, sample or picture with information as to the material, quantities, machines and horsepower available. In a week you will receive a print for approval and in another two weeks the actual tool will be making chips fly.

FREE — 52 page book of Blueprints of actual multiple-diameter tools designed for combination milling, boring, counterboring, facing and chamfering with one stroke or pass.

THE OK TOOL COMPANY • 400 Elm Street • Milford, New Hampshire

OK

modern milling cutters *for* modern milling machines

multi-diam tools • reamers • boring heads • form cutters

OSBORN® *announces:*

a new concept in power brushing tools

How
TY. BRUSHES
will significantly cut your finishing costs

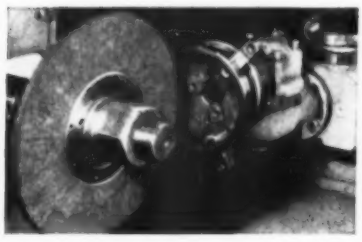
Designed for jobs *beyond the reach* of standard wire power brushes, Osborn TY. Tool Brushes are literally a new concept in finishing tools.

Where rotary files, abrasive stones or belts, tumbling and shot blasting equipment have been used—TY Brushing Methods now do many of these jobs *better . . . at significantly less cost.*

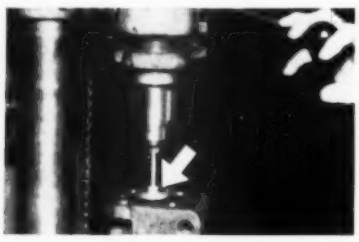
These exclusive TY Brush advantages have been proved through extensive field tests—

- *Maximum of work efficiency with minimum of pressure*
- *Greatly increased brushing action strength*
- *Positive control over area of brush contact*
- *Complete uniformity of finish*
- *Exceptionally long brushing tool life*

Osborn TY Brushes will give you a higher rate of output . . . better product quality . . . lower end-of-service cost. Write or call us today for full information. No obligation, of course. *The Osborn Manufacturing Company, Dept.* C-79, *Cleveland 14, Ohio.*



Blending Gear Tooth Edges *and deburring in a single precision operation is done with Osborn TY Monitor® Brush running at 1750 rpm on Brushamatic® 3A Machine.*



Cleaning and Finishing *internal surfaces of machined castings is done with an Osborn TY Ringlock® Brush mounted on a simple drill press setup. Operation is rapid, thorough—low cost.*

Osborn Brushes®

BRUSHING MACHINES
BRUSHING METHODS
POWER, PAINT AND MAINTENANCE BRUSHES
FOUNDRY PRODUCTION MACHINERY

Numerical Control . . .

settings, running time, and prior cut checking against the cuts to be made.

In introducing numerically controlled machine tools into your own facilities, there are several organizational considerations to which you should be alerted:

Conversion to numerical control is a two-fold problem, and must be considered as such, to effect the greatest economical gains within your own facility. In the beginning, you must set up to run these machines in the most expeditious manner possible, with what you have on hand, to gain experience and to provide even the most basic training for this primary operating group. This operation will also serve as a good check-out for your equipment, your maintenance ability, and your operating aids.

Parallel with this, establish a group capable of doing a complete system development for the numerical-control problem, as it applies to your facility, by starting with the engineering-drawing configuration, and working through your entire system of production—from tooling to fabrication and inspection of the finished part. This is the best way to create the optimum system for maximum utilization, and the greatest economic realization of numerical control, tailored to your facility.

Numerical control as a tool, and as an economic development, is not different from any other problem. If you understand it and apply it properly, you and your industry will benefit from it. By starting now, your company will maintain a lead position.

"Your eyes are like limpid pools of azure—so **keep** *'em that way by wearing your safety glasses!"*

only *Lapmaster* would guarantee a flatness of ±.00005" on parts weighing 4920 lbs.

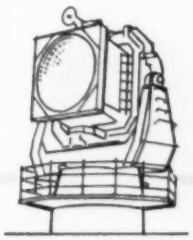
Proper functioning of this vital missile tracking equipment required the highest degree of accuracy obtainable in flatness and parallelity on several component parts . . . some of unusual weight and size. Of all the precision machine tool manufacturers asked to submit recommendations and quotations, only the Lapmaster Division of Crane Packing Company would guarantee to meet the tolerances.

Handling large and odd shaped parts was not new to the Lapmaster. Standard Model 84 Lapmasters had long been lapping to flatness within three light bands (.000035") on large castings. Therefore only a few modifications to the standard Lapmaster 84 were required to take care of the 4920 lb. 84" diameter weldment (see job data).

This job also required a machine with the versatility to handle a variety of small parts as well as the big ones. This customer found—as hundreds of users have—that size, shape or form is no problem to a Lapmaster.

On any job—flatness of the lap plate is continuously maintained by the patented reconditioning action of the conditioning rings.

INVESTIGATE the possibilities and advantages of machine lapping in your plant. Whether you have a problem of flatness and finish on parts the size of this 4920 lb. giant or pieces ⅛" in diameter there's a Lapmaster to do the job. Write for the latest Lapmaster technical bulletins.



JOB DATA

THE PARTS: Several component parts of a tracking antenna for a long-range radar system. Largest was weldment weighing 4,920 lbs. and measuring 84" in diameter with bearing lands of 48" O.D. x 46" I.D. and 14" O.D. x 12" I.D. (see photo).

THE SPECIFICATIONS: Flatness and parallelity had to be held to ±.00005" with bearing lands lapped on the same plane. Faces on mating part are also being lapped to the same specifications.

THE MACHINE: Standard Lapmaster Model 84 equipped with an 85" O.D. x 10" I.D. lap plate. Special roller bar with simple mountings and fixtures to control position of the odd shaped parts during lapping.

Lapmaster® . . . THE MACHINE THAT PUT PRECISION LAPPING ON A PRODUCTION BASIS . . .

A product of **Crane Packing Company**
6436 OAKTON STREET, Morton Grove, Ill. (Chicago Suburb)
In Canada: Crane Packing Company, Ltd., Hamilton, Ont.

New "Comapro" project cuts machining time up to 30% . . .

GULF MAKES THINGS

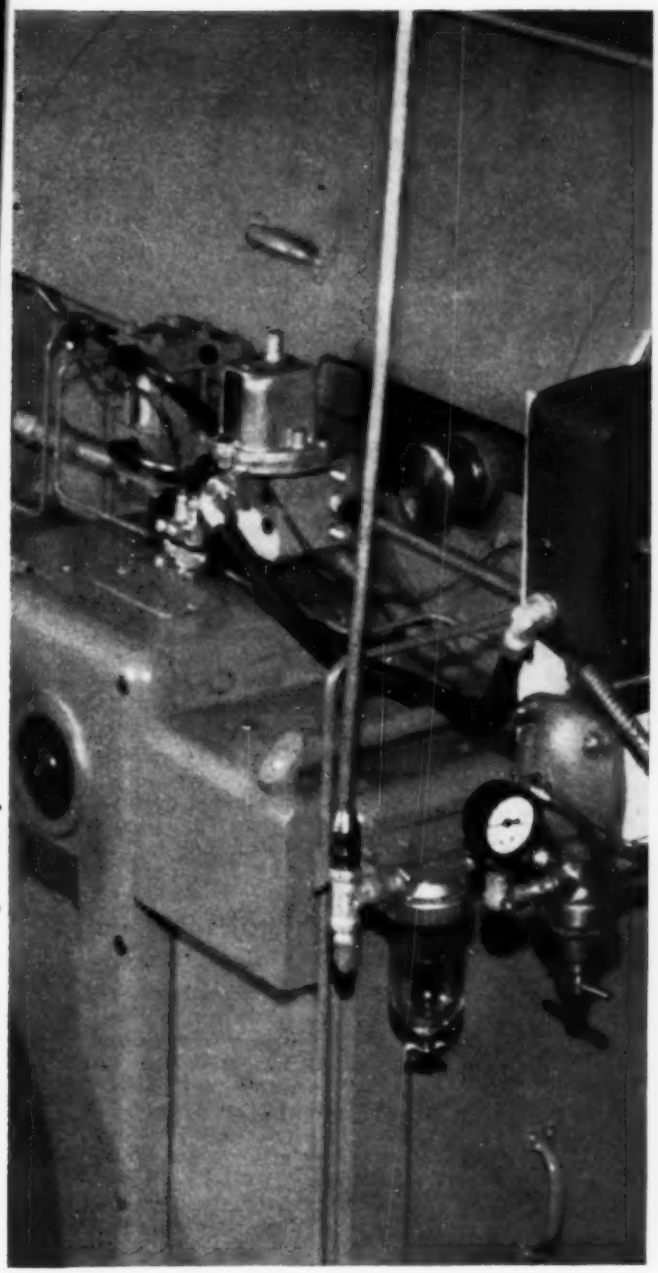
Only five months under way, the Cooperative Machining Project known as "Comapro" has already developed unusual time-saving and cost-cutting machining practices, using Gulfcut Cutting Oils.

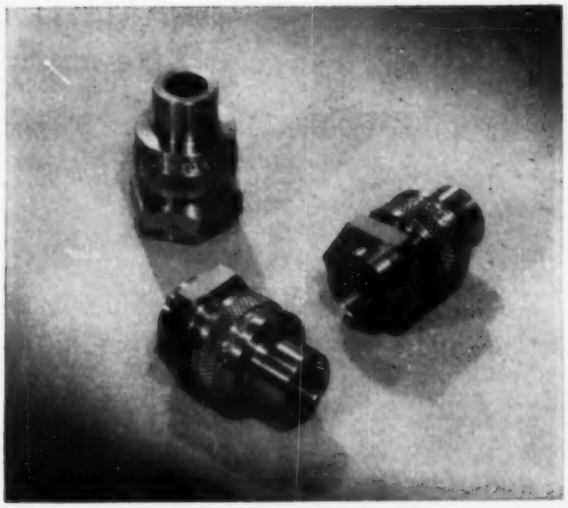
A case in point is the machining of a simulated spark plug shell at the COMAPRO Department of one of the participating manufacturers—Cone Automatic Machine Company, Windsor, Vermont.

Using Gulfcut Cutting Oil in a Conomatic bar machine, they're running this spark plug part in 4.4 seconds, compared to an industry average of 6 seconds. A 30% saving in machining time!

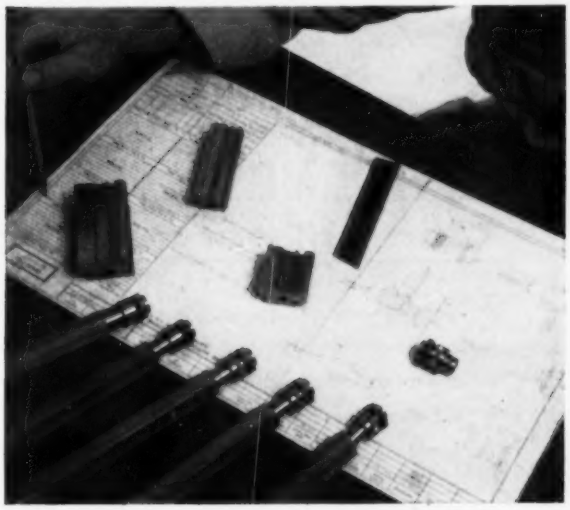
This is right in line with the over-all objective of "Comapro"—to develop more efficient ways to cut the cost-per-part figures in a wide variety of machining jobs, particularly in mass production. Findings will be made available to the entire metalworking industry.

As a co-sponsor of "Comapro," Gulf supplies all the





Lower cost per piece—on a great variety of machined parts—is the main goal of the "Comapro" cooperative cost-research program. For complete information on the latest findings of the project, write to COMAPRO, c/o Cone Automatic Machine Company, Windsor, Vermont.



This Conomatic automatic bar machine is a pilot unit in the "Comapro" research project. Gulfcut Heavy Duty Soluble Oil helps it operate at maximum output, to determine best machining practice at lowest cost per part.

and proves again

RUN BETTER!

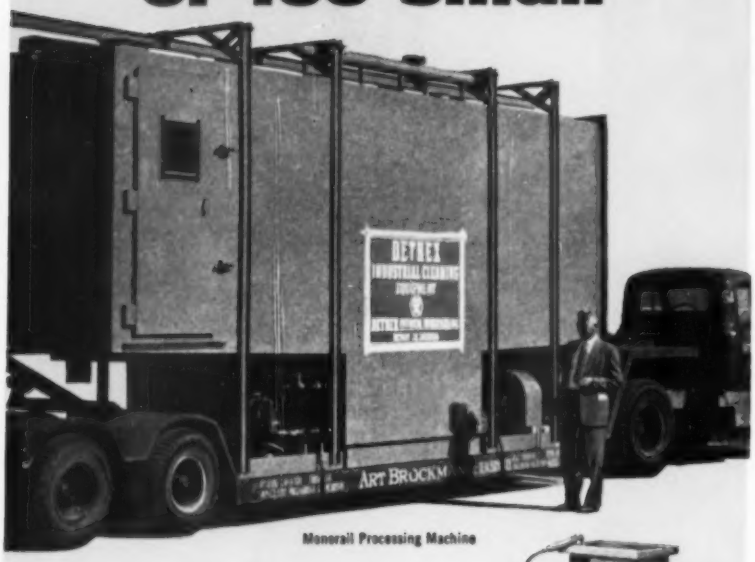
cutting oils for the project, from the complete Gulfcut line—plus Gulf greases and machine lubricants. Under closely controlled research conditions, the proof is piling up that Gulf makes things run better!

Let us help you put "Comapro" findings to work in *your* production—and show you how Gulf makes things run better in your plant, operation-wise and cost-wise. For complete information, call a Gulf Sales Engineer at the nearest Gulf office.

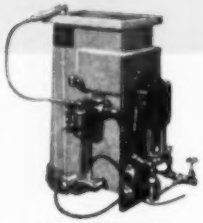
GULF OIL CORPORATION
Dept. DM, Gulf Building
Pittsburgh 30, Pennsylvania

GULF

Nothing too Big or too Small



Monorail Processing Machine



Ultrasonic Degreaser

DETREX EQUIPMENT Cleans Them All

Ranging from single stage, hand-operated degreasers through huge spray washers, or multi-stage processing machines, DETREX has the experience and ability to provide equipment that saves you money. If your cleaning process requires ultrasonics you can be serviced by the leader in the field with famous Detrex "Soniclean" units.

When DETREX equipment is applied to your specific needs, coupled with DETREX chemicals and DETREX service, you have the highest degree of quality and efficiency in the metal cleaning field. You can have it in your operation tomorrow. Find out about it today.

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- Ultrasonic Equipment
- Industrial Washers
- Phosphate Coating Compounds
- PAINTBOND Compounds
- Aluminum Treating Compounds
- Alkali and Emulsion Cleaners
- PERM-A-CLOR NA (Trichlorethylene)
- Rust Proofing Materials
- Extrusion and Drawing Compounds
- Spray Booth Compounds

DETREX CHEMICAL INDUSTRIES, Inc.

Box 501, Dept. AM-159, Detroit 32, Mich.

FIELD REPORT...

$136 Million AF Contract Goes to McDonnell Aircraft

In addition to this contract for F101B Voodoo airplanes, McDonnell has under negotiation several additional orders amounting to more than $100 million. New contract, plus expected orders, brings the St Louis-based fighter manufacturer's total unfinished business to more than $628 million. Backlog on Oct 31 was $446 million. Included in the orders to come is a production contract for the new F4H Navy fighter which has been chosen as Navy's new all-weather interceptor for carrier use.

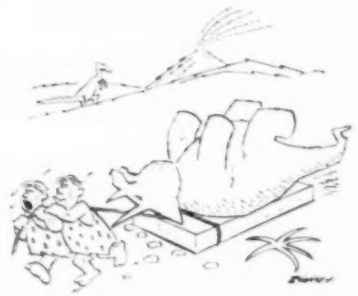
RCA's Transistorized Data Processing System

Radio Corp of America has begun production of a completely transistorized, general-purpose electronic data processing system. The RCA 501 requires only half the floor space of comparable equipment using electronic tubes and is designed to bridge the gap between electro-mechanical accounting machines and giant electronic computers.

Basic unit, consisting of computer and input and output equipment, is priced at $675,000 and will rent for $13,500 a month.

Dana Corp and Aircraft Armaments Teaming Up for Defense Work

Dana, headquartered in Toledo, and Aircraft Armaments, Inc, Cockeysville, Md, have formed a working agreement under which the two firms will cooperate in the development and production of equipment for the armed services. Dana is a 55-year-old veteran of the automotive, aircraft, and allied transportation industry parts manufacturing field, and has for many years been



"I don't see why you want new hauling equipment with wheels when this one isn't costing us anything."

Talking About Die Sets

with

Phil Marsilius

Executive Vice-President
The Producto Machine Co.

Die Set Maintenance in the Pressroom—The vital die-maintenance procedures required periodically when a die is removed from the press for sharpening should be coupled with systematic die set inspection and maintenance in the pressroom.

In addition to having a planned schedule of lubrication (based on any of the methods previously discussed in this space), you can make sure of getting the most out of your investment in die sets—and the costly dies and presses with which they are used—by following a simple set of procedures for inspecting and maintaining die sets in the pressroom.

Although there are no hard-and-fast rules that can be established for all die sets, the procedure listed below is generally followed at leading stampings plants in the East. These companies point out that die sets used in the cutting of extremely thin material or for very critical parts would naturally require a more stringent inspection than those used for blanking heavy material or for comparatively simple parts.

At one plant, specializing in long runs of close-tolerance parts for the electronics industry, the procedure followed is:

1. No inspection of the die set during production run unless, of course, there is overheating, pick-up on the guide pins or other obvious difficulties.

2. When the die is taken off the press for sharpening or maintenance, the die set is visually inspected for pick-up or score marks on either the guide pins or bushings. Pins and bushings are carefully cleaned to remove excess lubricant.

3. After approximately 1,500,000 strokes, the set is thoroughly checked for wear on both the pins and bushings. On the average, up to .0003" wear on pins and bushings is allowed before replacement with new components is scheduled. In addition, the die set is placed on a surface plate and an indicator is placed over one end of the set. An attempt is then made to rock or twist the set by hand to establish how much the die set can be deflected. On a 10" set, a maximum of .005", but usually less, total deflection is allowed.

Because the die set plays such an important part in prolonging the accuracy and lifetime of a die, it pays to take the little extra time required to do justice to die set maintenance in the pressroom.

4. During regular or periodic regrinds, the die set is not checked for bent or distorted punch and die holders unless the die has been damaged or there is reason to believe the set may have warped.

During the overall period, if the pins and bushings are replaced, the punch and die holders themselves are checked for warpage or distortion. If necessary, these components are reground prior to assembling the new pins and bushings.

Four-stage blanking and shaving die, Lenkeit Machine & Tool Co., Inc.

Why the pressroom foreman prefers Producto die sets

They keep his downtime down

Keeping production *up* and downtime *down* is the main job of the pressroom foreman. He knows Producto die sets can help him do this job successfully because they maintain accuracy for long runs. All catalog steel sets are annealed to prevent distortion.

He is aware that Producto can provide him with any type of die set he needs—whether for standard or special presses—in a wide range of sizes and thicknesses, with or without clamping flanges.

The pressroom foreman knows that Producto guide pins are mirror-finished to eliminate scoring, and that Producto die sets are available with a variety of lubrication devices to keep them "running cool".

He knows, too, that he is not restricted to the use of predetermined press stroke or shut height because Producto offers an unlimited choice of pin and bushing lengths. Moreover, he can get the bolster he needs to protect his die at the same time he gets his die set. Both die set and bolster can be ordered in steel or cast semi-steel depending on strength requirements.

The pressroom foreman realizes that Producto Qwik-Fit Die Sets make "take-apart-and-put-together" easy during die maintenance. He also knows that Qwik-Fit removable pins and clamp-type bronze bushings are available when the application calls for them.

He can *produce more* with Producto die sets. So can you.

A WEALTH OF DIE SET KNOWLEDGE is packed into Producto's Catalog No. 11 and regular issues of *Die Set Digest*. Write today for these free aids.

THE PRODUCTO MACHINE COMPANY
975 Housatonic Avenue, Bridgeport 1, Connecticut

PRODUCTO

Wherever die sets are used

PRODUCTO

PRODUCE MORE WITH PRODUCTO PRECISION DIE SETS

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BIJUR

AUTOMATIC LUBRICATORS

For DESIGN, SERVICE AND RESEARCH are part of every Bijur System

Consider Service—Bijur Field Engineers work hand in hand with machine builders to custom design a Bijur system which will amply meet the needs of the machine for automatic lubrication.

How you benefit—Whether you are a designer, purchasing agent, or plant engineer, you'll see substantial savings when you have Bijur Systems in the equipment you own and manufacture. Custom designed, Bijur Systems are easy to install, reduce down-time and repair bills, increase production, eliminate costly hand oiling. There's no chance for product spoilage due to over-lubrication, Bijur Systems deliver the right amount of metered oil to every bearing, *when it's needed*. Costly hand oiling is eliminated.

Write today for all the facts on how Bijur Systems can solve your lubricating problems.

BIJUR AUTOMATIC LUBRICATORS—STANDARD EQUIPMENT IN MANY INDUSTRIES
Machine Tools • Business Machines • Printing Machinery • Textile Machinery • Food Product Machines • Bottling Machines • Packaging Machines • Sheet Metal Machines • Plastic Fabricating Machinery • Glass Products Machinery • Wood-Working Machinery • Industrial Sewing Machines • Special Process Equipment

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Rochelle Park, New Jersey

Pioneers in Automatic Lubrication

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Field Report . . .

a designer and supplier of parts, components, and equipment to the military. Aircraft Armaments develops and manufactures complex systems and subsystems for land, sea, and air use, mainly electronic or electromechanical.

Manitowoc Ship to Build Giant Ore Carrier

Inland Steel Co, Chicago, has contracted for construction of a new ore carrier, largest and most powerful ship ever designed for the Great Lakes trade. It'll be built by Manitowoc Shipbuilding, Inc, of Manitowoc, Wis. Work is to start immediately with launching next fall and completion is scheduled for the opening of the 1960 shipping season. To be christened the Edward L Ryerson, features of the 730-ft-long, 9000-shaft-hp vessel include air conditioning for all living quarters; max cargo of 26,930 gross tons; and speed (loaded) of 16¾ mph. New addition will bring the Inland fleet to six ships.

Franklin Electronics . . .

. . . Bridgeport, Penna, has set up a West Coast Division in Van Nuys, Calif, to carry on new product development and research. It'll also design and build complex digital systems for the process and missile industries.

DuPont Building New Plant For Linear Polyethylene

Facility to produce the material by a low-pressure process is going up at the company's Sabine River Works at Orange, Texas, and is scheduled for completion by mid-1960. DuPont has been producing conventional

(continued on page 259)

"Good idea, Higgins . . . thinking of these on your own time?"

"I get 1200 parts a minute from each of these presses...

...all day long!" And production like that continues day in, day out. For Bliss High Production presses are especially designed for continuous high speed operation. Counterbalanced shaft, massive tie rod frame... square gibbing... features like these add up to *enduring* speed. For ease of operation there's ample room in front and back for die setting and space *under* the press for tote boxes or stacking chutes. Naturally, if you use large quantities of stampings this is the press that makes them. You will, however, be surprised to learn, that H-P presses can be set up so quickly and efficiently that more and more firms are using them for short run work.

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SINCE 1837

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name... it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CAN MACHINERY • CONTRACT MFG.

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RIVETT SQUAREMASTER "100" CYLINDERS

Unfailing POWER for MILLIONS of cycles!

Here's sure power for unfailing cylinder operation. SQUAREMASTER 100's are the world's finest constructed cylinders—perform with 100% efficiency! 200 P.S.I. air to 500 P.S.I. oil. Available in 7 mountings with standard dimensions, in 10 bore diameters, internal and external threading. Special models and cover combinations. Priced competitively; prompt delivery; meet all J.I.C. requirements.

RIVETT, INCORPORATED

Dept. AMH-1, Brighton 35, Boston, Mass.

*Initial High Coefficient of Static Friction

POWER-PACKED FEATURES PROTECTED BY POWER-GUARD CONSTRUCTION

1. Piston rod. Ground and polished alloy steel. Hard chrome-plated. **2.** Piston rod bearing. Replaceable cartridge-type. **3.** Piston packing adjusts automatically. V-block packing minimizes friction. **4.** Correctly stressed tie rods. **5.** Cushion bushings. Bronze, floating type. **6.** Ports rotated to any 90° position. **7.** Steel covers. Take minimum mounting space.

Send for catalog. Proof of SQUAREMASTER efficiency stated in these 20 pages. Write today.

RIVETT

furnishes a complete power package

AIR AND HYDRAULIC — VALVES, CYLINDERS, POWER UNITS

Member — National Fluid Power Association

polyethylene by a high-pressure process since the early years of World War II. The linear product, to be known as Alathon, differs from conventional polyethylene used in squeeze bottles, packaging film, wire insulation, and pipe, in its greater rigidity and strength under higher temperatures. The Sabine River Works, a major producer of conventional polyethylene, currently employs 2000 persons; new unit will provide jobs for about 50 additional operating employees.

Martin $12 Million ATRAN Job

Martin Co, Baltimore, has a $12.5 million AF contract for continued production of the ground-to-ground guided missile. New order will permit it to continue deliveries of the jet-powered weapon.

Inland Steel Products Co Expands on West Coast

The Milwaukee company has purchased its first west coast manufacturing plant, the facilities of Pacific Metal Decking Co, Hayward, Calif. The new San Francisco Bay Area plant will turn out steel roofing, decking, and siding, and other metal building materials, and will supplement an Inland warehouse in Los Angeles. Additional manufacturing facilities will be constructed within a year at Hayward, and more products in the metal building products field will be added.

1.5-Million-lb-Thrust Engine Will Be Built by Rocketdyne

North American Aviation's Rocketdyne Division has a $200-million-plus contract from National Aeronautics & Space Administration to design

FREE ANALYSIS
OF YOUR DIFFICULT MACHINING PROBLEMS

PAVES WAY FOR NEW FLOW METER DESIGN

PROBLEM: find a way to cut a precise, tapered orifice in a stainless steel tube, needed for a new type flow meter to measure accurately pressures up to 15,000 psi. **SOLUTION:** A Raytheon Ultrasonic Impact Grinding Analyst suggested impact grinding it with a tool .0005" under the final size of the orifice. **RESULT:** a precise, uniform tapered orifice held to .0002" tolerance, elimination of slow, costly milling and filing . . . and a COMPLETELY NEW flow meter design which does not require a bulky, expensive tapered tube. The meter is manufactured by the C-Mar Corp., Manasquan, N. J.

HOW YOU CAN BENEFIT

Whatever your difficult cutting, slicing, drilling or shaping problem—in hard or brittle material, your Raytheon Impact Grinding Analyst can help you solve it. For full details, fill out the enclosed coupon and send it in. No cost or obligation.

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Excellence in Electronics

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☐ Please send me literature on Raytheon Impact Grinders.

☐ Please have a Raytheon Impact Grinding Analyst contact me.

My problem is: (describe metals or non-metals involved, tolerances, etc.)

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COMPANY_____

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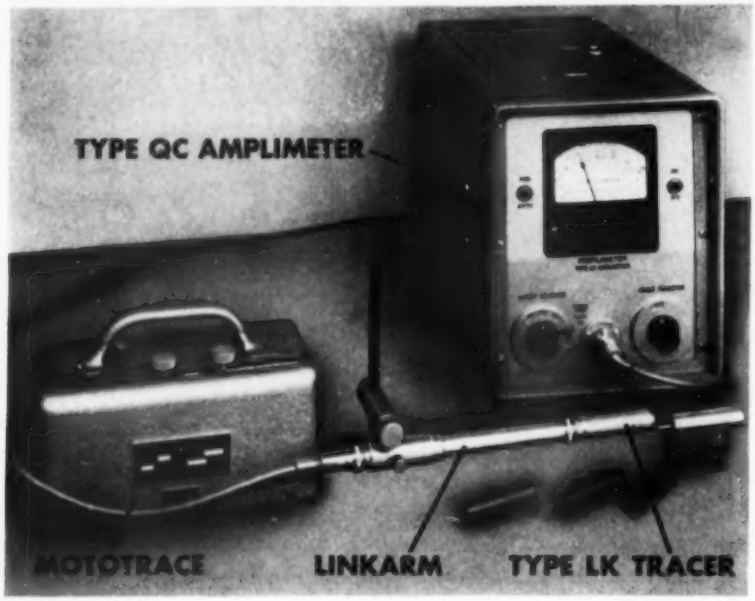
NEW! Profilometer® GROUP III



Measures Roughness of Surfaces from 1/8" to Flat — ID and OD

THIS shop equipment handles an exceptionally wide range of roughness measurement—with *proven Profilometer accuracy.* It is lightweight and portable — built for use by shop personnel — and includes the following items:

NEW Type LK Tracer — Measures on ID's and OD's as small as 1/8" — flats — tapers — narrow splines — gear teeth. Passes through a 3/4" hole.

NEW Type QC Amplimeter — Shows roughness from 0 to 1000 microinches (arithmetical or r.m.s.) on an easy-to-read meter. Has 3 standard roughness width cutoffs. Factory-calibrated for dependability.

Mototrace and Linkarm — Give the Tracer a steady support and smooth motion, essential to dependable measurement. No operator skill required.

FREE LITERATURE gives details. Write for it. And, without obligation, let us arrange for a demonstration in your plant. We have representatives in principal industrial centers throughout the Free World.

Remember: You can DEPEND on the PROFILOMETER — first in surface roughness measurement since 1936.

Profilometer is a registered trade-mark.

MMC® MICROMETRICAL MANUFACTURING COMPANY
351 S. MAIN ST. ANN ARBOR, MICHIGAN

Field Report . . .

and build a single-chambered, liquid-propellant rocket engine for use in launching giant satellites and manned spacecraft. Company carried out a study project on the engine under an early $600,000 AF contract. Project will take from four to six years.

Kenett Corp Has Been Formed . . .

. . . to handle sales and distribution of fluid valves and other hydraulic and pneumatic components to industrial and aircraft companies in the New York and New England areas. Sales and engineering headquarters are in Brookline, Mass. Firm, headed by Jules Kendall, formerly vice president and general sales manager of Greer Hydraulics, Inc, has a complete engineering staff for design and manufacture of specialized test stands, environmental test chambers, and hydraulic power packs made to specific requirements.

Lockheed to Build Major Research Center

Lockheed Aircraft's Calif Division has purchased a 198-acre site near Saugus for a multi-million-dollar advanced scientific research center to explore problems of flight up to 10 times the speed of sound. First step will be construction early this year of a $5 million supersonic wind tunnel and high-altitude environmental test facilities capable of subjecting complete aircraft to simulated conditions of flight up to 150,000 ft. Smaller altitude chamber simulating 500,000-ft altitudes is projected. Among later steps in the building program, projected through 1963, will be to supplement the wind tunnel (up to Mach 5, or five times the

"I'd like to see their faces when they try to machine this stuff!"

Roll up the score

with MILLERS FALLS INDUSTRIAL TOOLS

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We'll demonstrate Millers Falls tools on the toughest job in your own shop, or send you complete information about our full line. Just write us.

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SINCE 1868

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Dept. AM-16
Greenfield, Mass.

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Daddy isn't the boss...

He's just in charge of putting gears in the machines. But he doesn't growl anymore when he comes home. Mommy says he doesn't worry now about bad gears and not getting them on time since they buy them from CINCINNATI GEAR.

Why not investigate the advantages of having your gears and gear boxes made to suit your needs exactly? CINCINNATI gears are precision made, precision inspected, GUARANTEED—with delivery dates as promised. Ask us to quote on your requirements.

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THE CINCINNATI GEAR CO.

Wooster Pike and Mariemont Ave. Cincinnati 27, Ohio
Custom Gear Makers Since 1907

GEARS, good gears only

Field Report . . .

speed of sound) with one of hypersonic capability (up to Mach 10) for study of practically any vehicle that will travel in outer space, and to provide facilities to study propulsion installations to achieve these speeds.

Northrop Building More Snarks

USAF and Northrop Div of Northrop Aircraft have completed negotiation of a $50 million contract covering production of additional Snark SM-62 intercontinental guided missiles. Order covers manufacture of additional operational Snarks plus spare parts and ground support equipment; it provides for continuation of the program through Dec 1960. Missile is being delivered to units of SAC and will be in service this year at Presque Isle AF Base, Maine.

Sperry Gyroscope Div . . .

. . . of Sperry-Rand Corp, Great Neck, NY, has an AF contract for $2.8 million worth of radar sets, spare parts, ground support equipment, and data.

Blaw-Knox Proposes to Buy Assets of Aetna-Standard

Blaw-Knox Co has offered to purchase assets (exclusive of cash and receivables) of Aetna-Standard Engineering Co. Aetna shareholders will vote at a special meeting early next month. Both companies are headquartered in Pittsburgh. B-K, with more than a dozen manufacturing plants, produces rolls and rolling mills for the steel and nonferrous metals industries, heavy steel and alloy castings, and construction and

"I hate a machine that's smarter than me."

introducing a

NEW

OLOFSSON

HEAVY DUTY PRECISION BORING MACHINE

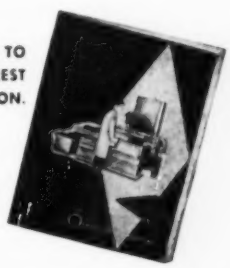
Designed for better precision finishing...semi-finishing...and roughing of large, bulky parts

This newest in the line of Olofsson Precision Boring Machines, the Model 22, is designed for more profitable heavy-duty rough and finishing boring, facing, chamfering, turning and grooving operations. Put one to work . . . and profit potential goes up. Because of the versatility of its new design, operating costs go down.

MODERN, WITH 22 QUALITY-DESIGN FEATURES, the Olofsson Model 22, weighs a hefty 7,600 lbs., untooled; and incorporates such design features as:

- *Extremely low ratio, height to width, of spindles to ways.*
- *Hardened and ground Alloy Steel flat and vee ways.*
- *Extra-large fixture mounting provides maximum stability for mounting large work pieces.*
- *Integral chip chutes completely surround any fixture tooling.*

WHATEVER YOUR PRODUCTION REQUIREMENTS, IT WILL PAY YOU TO FULLY INVESTIGATE THE MODEL 22. CONTACT YOUR NEAREST OLOFSSON REPRESENTATIVE. Or, if you prefer, write direct to OLOFSSON.



THE OLOFSSON

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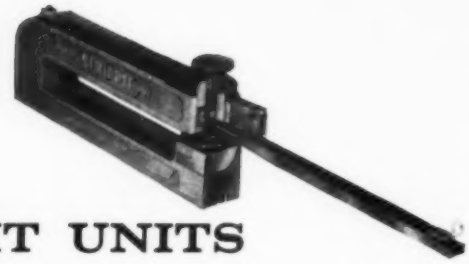
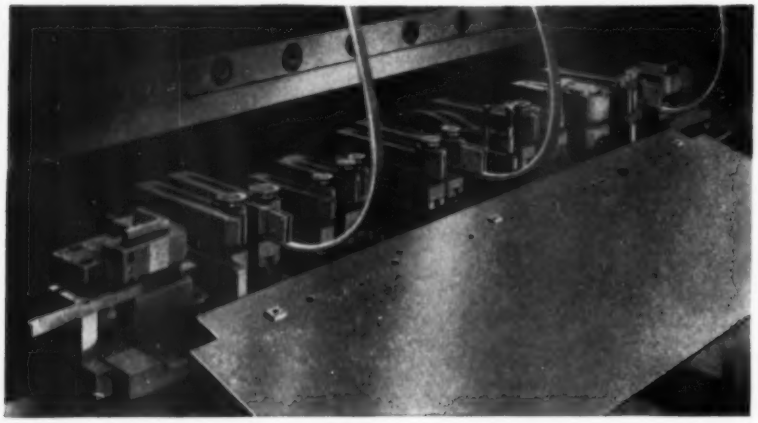
MANUFACTURERS OF PRECISION BORING AND SPECIAL MACHINERY

CIRCLE 216 READER SERVICE CARD



NEW STRIPPIT UNITS

. . . stake nuts permanently with every press stroke!



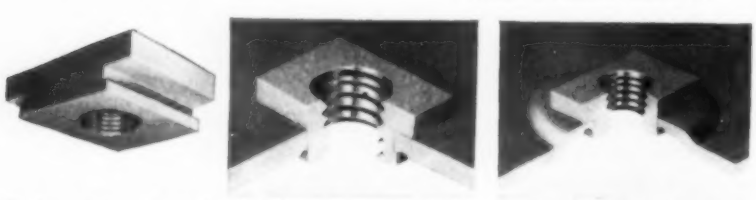
STRIPPIT PIERCE NUT UNITS save operations, time and money in assembly panel production with single-stroke insertion of Fabristeel Multipierce Nuts* into sheet metal up to .125" thick.

Permanent Fastening by an Exclusive New Process—as nut pierces stock, metal flows into nut shoulder slot, becoming an integral part of the stock.

High-Speed—fast press setups, automatic feed of nuts to units for long, medium or short runs gets maximum production per press.

Flexibility—Pierce Nut Units can be quickly press-mounted in any desired pattern, changed on short notice, re-used over and over.

*A Product of Fabristeel Products, Inc.



Each nut is its own punch, a new one each time — *Die button causes material to flow into nut slot* — *Simultaneous embossing for flush fastening*

WRITE FOR DEMONSTRATION on your press! The speed and simplicity of Strippit Pierce Nut operation has to be seen to be believed. Also request new catalog for complete specifications.

WALES STRIPPIT INC.
200 Buell Road, Akron, New York
In Canada: Strippit Tool & Machine Company, Brampton, Ontario

UNITED INDUSTRIES INC. HOUDAILLE

Field Report . . .

certain utility equipment. Aetna, with plants at Warren, Ohio, and Ellwood City, Penna, makes seamless and buttweld pipe mills, cold drawing equipment, and tinning, annealing and galvanizing lines for the steel industry, as well as equipment for the copper, brass, aluminum, rubber, plastic, and chemical industries.

Olin Mathieson and Textron Form Jointly Owned Company

Olin Mathieson Chemical Corp and Textron, Inc, both headquartered in New York, have established Almetco, Inc, to produce aluminum extrusions for the two firms. New company will operate plants formerly owned by Textron at Girard, Ohio, and Nesquehoning, Penna. Production capacity will be shared equally by Olin and Textron Metals Co, a Textron division; Olin will not be associated, however, with products manufactured and sold by Textron Metals.

Goodyear Missile Contract

Goodyear Aircraft Corp, subsidiary of Goodyear Tire & Rubber Co, has a $1.7 million AF contract for ATRAN nose sections, spares, and data for the TM-76A Mace missile. Letter contract, part of a definitive contract to be negotiated in full later, will run up to an estimated $38 million.

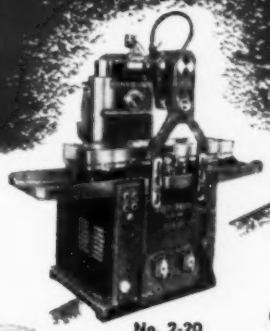
New Aircraft Society Formed

A new technical society has been formed on the East Coast to complement a similar group on the West Coast and in the Southwest. New unit is called the Society of Aircraft

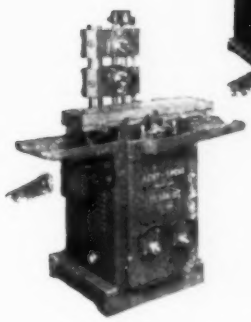
"How come you're always on time?—Why can't you be late like the other foreman!"

EXTRA RUGGED... SPEEDY... ACCURATE...

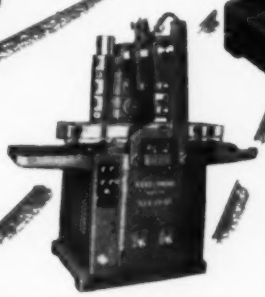
to Bring Down Milling Costs!



No. 2-20
20" table travel... 42" x 12" table.. fully automatic hydraulic table feed.

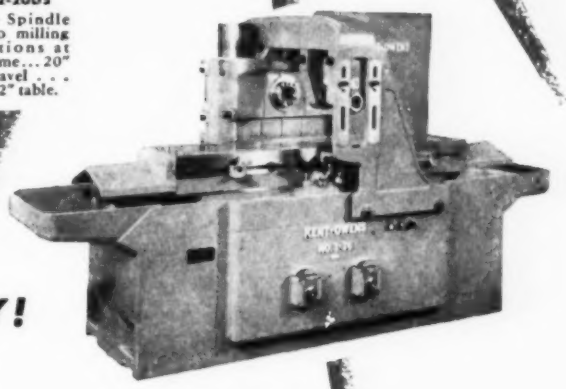


No. 1-14DS
Double Spindle for two milling operations at same time ... 14" table travel ... 32" x 9" table.



No. 2-20DS
Double Spindle for two milling operations at same time... 20" table travel . . . 42" x 12" table.

No. 2-20V
20" table travel... vertical spindle with speed range 32 to 1284 R.P.M. . . . 42" x 12" table.



No. 3-36 . . . 36" table travel . . . 64" x 16" table . . . full automatic hydraulic feed.

No. 1-14
32" x 9" table ... 14" table travel . . . hydraulic table feed . . . full automatic cycle.

STEP UP SPEED and ACCURACY!

Put the work on Kent-Owens Machines for top-speed milling and topmost accuracy to keep your costs at a minimum! Advanced features throughout make the difference . . . greater dependability . . . accuracy maintained. Twin-post head mounting assures balanced load. Greater cutting efficiency—only two gear contacts, motor to spindle. Write for bulletin #757 on wide range of hydraulic and hand-operated machines. Let us quote on proper machine complete with tooling for your operation. Also, call on Kent-Owens for special machines. Kent-Owens Machine Co., Toledo, Ohio.

KENT-OWENS
for milling machines

KENT-OWENS REPRESENTATIVES

BOSTON
General Machinery Corp.

BUFFALO
Beesley-Hofmann Mach'y Co.

CHICAGO
Four States Mach'y Company

CLEVELAND
Garco Machinery, Inc.

DALLAS
Hunter Machine Tool Co.

DAYTON
C. H. Granger Mach'y Co.

DETROIT
A. J. Habeckorn Mach'y Co.

FT. WAYNE
Dixie Machinery Co.

GRAND RAPIDS
Joseph Monaghan & Co.

HAMILTON, ONT.
F. F. Barber Mach'y Company

HARTFORD
Harrington Wilson-Deam Corporation

HOUSTON
Oliver H. Van Horn Co., Inc.

INDIANAPOLIS
Oasis Machinery Co.

KANSAS CITY
Eichman Machinery Co.

LOS ANGELES
Machinery Sales Co.

MILWAUKEE
Four States Mach'y Company

MINNEAPOLIS
The Satterlee Company

MOLINE
John J. Normoyle Co.

MONTREAL
F. F. Barber Mach'y Co.

NEW ORLEANS
Oliver H. Van Horn Co., Inc.

NEW YORK
Harrington Wilson-Deam Corporation

OMAHA
The Ballweh Co.

PHILADELPHIA
Calco Machinery Company

PITTSBURGH
Barnes Machinery Company

ROCHESTER
Schiefer-Philipp Machinery Corp.

SAN FRANCISCO
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Starbuck Machine Tool Co.

SYRACUSE
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TORONTO, ONT.
F. F. Barber Mach'y Company

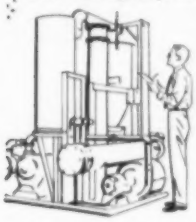
WINDSOR, ONT.
F. F. Barber Mach'y Company

Carl G. Paulson,
Director of Hayes Research and Development Group, Reports...

NEW NITROGEN POTENTIALS

Assume you face the need for high purity nitrogen at a low per-unit cost figure. You want to use it as a heat treating atmosphere . . . or as a "blanket" for hydrocarbons or food products . . . or for any one of a number of industrial applications. How can you bring this safe, inert gas out of the lab and into general use without inflating your costs?

Our R & D group reasoned that a low cost generator was the logical solution and followed up and developed a completely new piece of equipment—the C. I. Hayes "Nitro-Gen." This unique combination of stationary retort and cyclical programmed dryer has cleared the way for production of 99.99% pure inert gas at approximately 20c per thousand cubic feet.



The immediate benefits of low cost nitrogen as a protective heat treating atmosphere were revealed in initial metallurgical applications. For example, test bars of Type 8670 Carbon Steel were subjected to routine hardening under (1) nitrogen, (2) dissociated ammonia, and (3) endothermic gas atmospheres—each test followed by routine oil quench and tempering. Hardness results from these tests proved identical . . . but a substantial boost in toughness showed up in the bars treated under nitrogen. The nitrogen atmosphere produced 100% greater toughness, according to a transverse break test.

Safety alone makes nitrogen worthy of careful consideration. If this non-combustible gas can be produced efficiently and economically (and we're doing it!), Hayes Research and Development Engineers believe its potential — in heat treating and in *other "blanketing" operations* — is virtually unlimited. For further details on the new "Nitro-Gen" . . . now being demonstrated in our lab . . . request technical data.

Established 1905

C. I. HAYES, INC.

837 WELLINGTON AVE. • CRANSTON 10, R. I.

Whatever the job, **it pays to see HAYES** for metallurgical guidance, laboratory facilities, furnaces, atmosphere generators, gas and fluid dryers.

Field Report . . .

Materials and Process Engineers (SAMPE), Eastern Division.

The society will be concerned with problems of aircraft and missile materials and processes. Quarterly meetings are planned. Membership will include engineering personnel of the aircraft and missile industries as well as personnel of companies either directly or indirectly serving these industries.

Interested? Contact John S Thorpe, Allegheny Ludlum Steel Corp, Bell Bldg, Tarentum, Penna.

Kaman Aircraft Expands

The Bloomfield, Conn, company has begun construction of laboratories and offices for its nuclear research division on a 100-acre tract in Colorado Springs, Colo.

$10 Million Plant for SunOlin

SunOlin Chemical Co, recently formed subsidiary of Sun Oil Co and Olin Mathieson, plans to build a $10-$11 million plant on a 14-acre tract in Claymont, Del. Facility will turn out chemical compounds; construction will start in the spring.

Starrett Sets Up New Gage Div

L S Starrett Co, Athol, Mass, has established a new Special Gage Division with manufacturing, engineering, and sales facilities to design and build complete special gaging equipment. Division will advise on special gaging problems and will manufacture custom made units to meet requirements of any company.

American Can Absorbs Subsidiaries

Operations of two former subsidiaries, Sun Tube Corp and Bradley Container Corp, have been consolidated with the parent company. Facilities will be operated by a newly formed Bradley-Sun Division of

(continued on page 273)

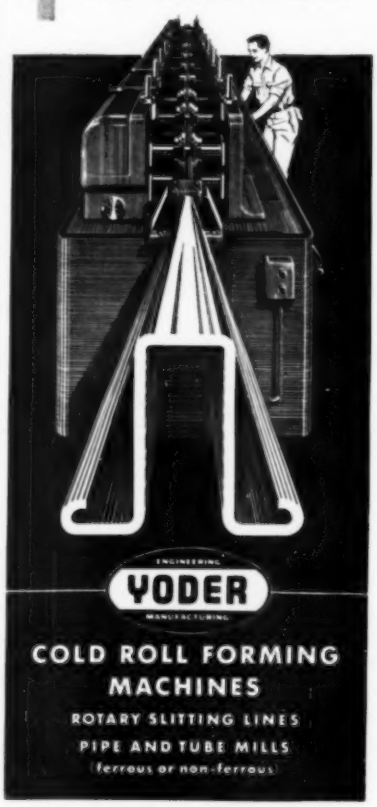
"Hey, who's he ringing in for?"

YODER

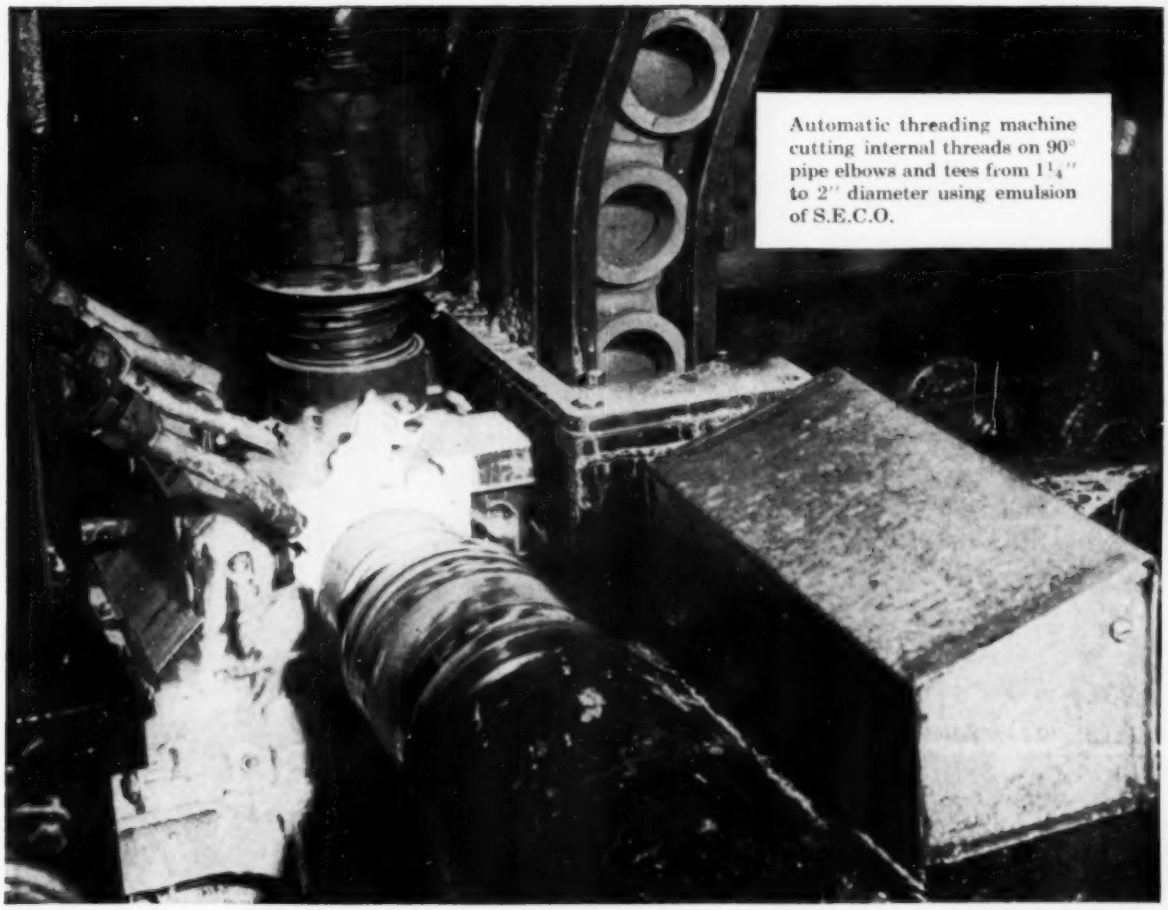
Roll Forming Equipment—Product dependability—integrity of manufacture—engineering for specific production needs have all contributed to establish Yoder equipment as the industry standard of excellence. Since 1909 Yoder-built machinery, including Pipe and Tube Mills, Roll Forming Equipment and Rotary Slitters, have earned world-wide customer satisfaction and recognition.

Profit from Yoder's years of engineering and service experience. Send today for the illustrated Yoder Roll Forming Equipment Book.

THE YODER COMPANY
5519 Walworth Ave., Cleveland 2, Ohio



COLD ROLL FORMING MACHINES
ROTARY SLITTING LINES
PIPE AND TUBE MILLS
(ferrous or non-ferrous)



Automatic threading machine cutting internal threads on 90° pipe elbows and tees from $1\frac{1}{4}$" to 2" diameter using emulsion of S.E.C.O.

Photo courtesy of Grinnell Corporation

NEW S.E.C.O. EMULSIONS, WITH SMALLER OIL-PARTICLE SIZE, CUT PRODUCTION COSTS

There's a new and greatly improved S.E.C.O. (Sunoco® Emulsifying Cutting Oil), that has smaller emulsion-particle size to give you the following benefits:

- BETTER PROTECTION AGAINST RUST, even at emulsion ratios as lean as 40-to-1.
- BETTER DETERGENCY, which permits dirt and fines to settle quickly out of emulsions, leaving machines clean.
- BETTER EMULSION STABILITY. Even in hard-water areas, emulsions of *new* S.E.C.O. stand up better than those made with other regular emulsifying cutting oils.
- BETTER FINISHES, CLOSER TOLERANCES. New S.E.C.O., with better coverage and wetting of work, produces consistently finer finishes in machining. Reject rate falls off. Tool life increases.

TRY *NEW* S.E.C.O.—for increased economy in all machining operations. Ask your Sun representative, or write to Department AM-1.

Industrial Products Department

SUN OIL COMPANY, Phila. 3, Pa.

SUNOCO

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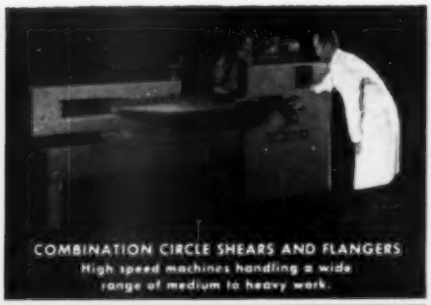
In Canada: Sun Oil Company Limited, Toronto and Montreal

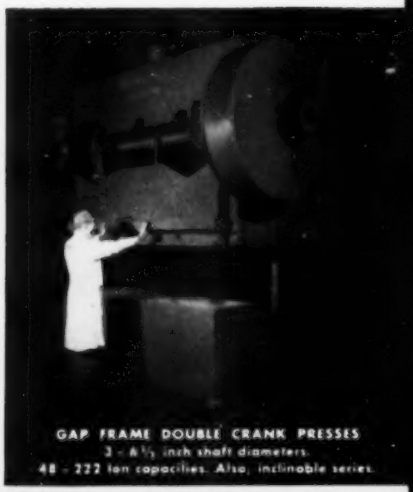
In plate or sheet metalworking . . .

NIAGARA MACHINES CAN

PRESS BRAKES
15-900 ton capacities.

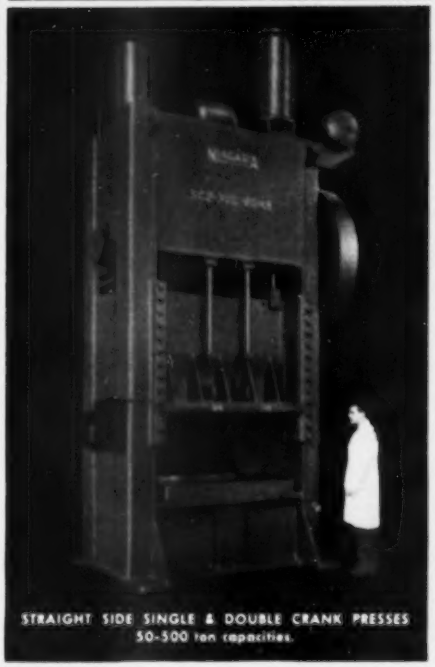


COMBINATION CIRCLE SHEARS AND FLANGERS
High speed machines handling a wide range of medium to heavy work.

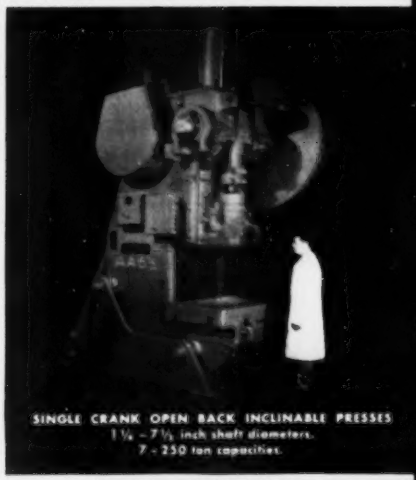


GAP FRAME DOUBLE CRANK PRESSES
3 - 6½ inch shaft diameters.
48 - 222 ton capacities. Also, inclinable series.

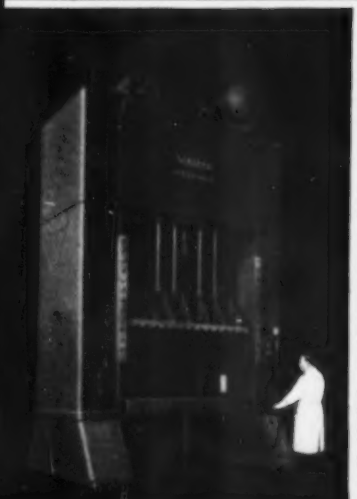
BENDING ROLLS
Hand and power driven for a wide range of lengths and thicknesses.



STRAIGHT SIDE SINGLE & DOUBLE CRANK PRESSES
50-500 ton capacities.



SINGLE CRANK OPEN BACK INCLINABLE PRESSES
1¼ - 7½ inch shaft diameters.
7 - 250 ton capacities.



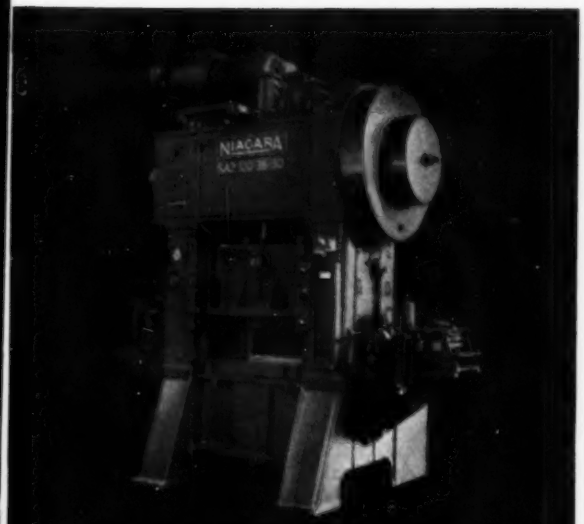
TRAIGHT SIDE ECCENTRIC GEARED PRESSES
One, two, and four-point suspension.
100-1250 ton capacities.
Standard and equipped for automation.

FRONT-TO-BACK CRANKSHAFT OPEN BACK INCLINABLE PRESSES
Standard and automation models.
45-200 ton capacities.

FRONT-TO-BACK CRANKSHAFT ADJUSTABLE BED PRESSES
Standard and modified models.
22-150 ton capacities.

FRONT-TO-BACK CRANKSHAFT DEEP THROAT PRESSES
22-150 ton capacities.

DO THE MOST FOR YOU



AUTOMATIC FEED HIGH PRODUCTION PRESSES
60-300 ton capacities.

UNDERDRIVE POWER SQUARING SHEARS
Shim stock to 1 inch capacities in lengths from 3 - 20 feet.

NIAGARA

America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

POWER PRESSES • PRESS BRAKES • POWER SQUARING SHEARS • ROTARY MACHINES • SLIP ROLL FORMERS • POWER ROTARY SHEARS • DRUM MAKING EQUIPMENT • ELECTRONIC AUTOMATIC WELDERS • GROOVERS AND SEAMERS • HAND OR FOOT OPERATED SHEARS • FOLDERS-BRAKES • LEVER SHEARS AND PUNCHES • HAND TOOLS

❊ MOST EXTENSIVE LINE:

From giant, power-operated machinery to small hand tools

❊ MOST ADVANCED DESIGNS:

Years ahead in performance through forward-thinking engineering

In the world's largest automotive and appliance plants or the smallest of sheet metal shops, Niagara machines and tools are usually at work "in force."

Batteries of giant presses are teamed up with speedy ring and circle shears. Massive, rugged press brakes stand side-by-side with powerful bending rolls and squaring shears. Versatile lever punches, rotary machines, groovers and seamers . . . all operate together to produce a better product at lower cost. The Niagara lines are "companion lines" of metalworking machines and tools that work together. A Niagara-equipped shop or plant is years ahead in quality and volume of production.

Whatever you require — power presses or hand tools — Niagara is the line that can do the most for you. It is the most complete in the industry . . . the most advanced in engineering. You can consult a Niagara representative with complete confidence of unbiased recommendations. Niagara has the right machines and tools for your requirements.

BRING YOUR FILES UP-TO-DATE WITH INFORMATIVE NIAGARA BULLETINS

A diversified and extensive list of machines and tools make up the famous Niagara line. Some of the principal types are illustrated. Be sure that you have the latest data on the ones that apply to your work. At your request, specific Bulletins will be mailed promptly.

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

DISTRICT OFFICES

Boston • Buffalo • Cleveland • Detroit • Indianapolis • New York • Philadelphia

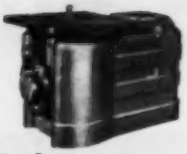
Distributors in principal U. S. cities and major foreign countries

CIRCLE 223 READER SERVICE CARD

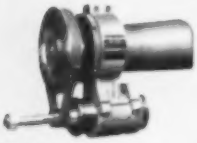
No. 6-12 Hydraulic
SURFACE GRINDER

No. 6-12 Hand Feed
SURFACE GRINDER

No. 2
Single Spindle
PROFILE GRINDER



No. 1
PROFILE GRINDER



High Speed
GRINDING ATTACHMENT

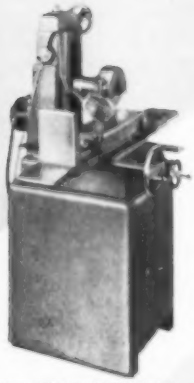
MACHINE TOOLS
by Boyar-Schultz

No. 2 Dual Spindle
PROFILE GRINDER

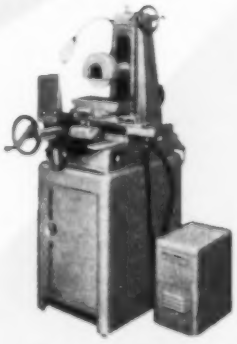
Lead Screw
TAPPING MACHINE

The name Boyar-Schultz on machine tools means quality. Modern design and engineering, together with the finest materials and workmanship assure you the utmost for your tool dollar.

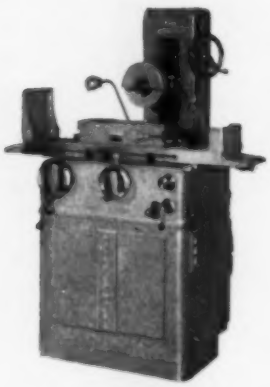
No. 2—6"
PROFILE GRINDER



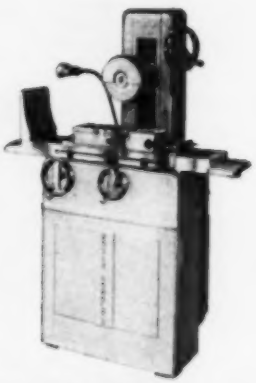
The CHALLENGER
No. 6-18 Hand Feed
SURFACE GRINDER



THE CHALLENGER
No. 6-18 Hydraulic
SURFACE GRINDER

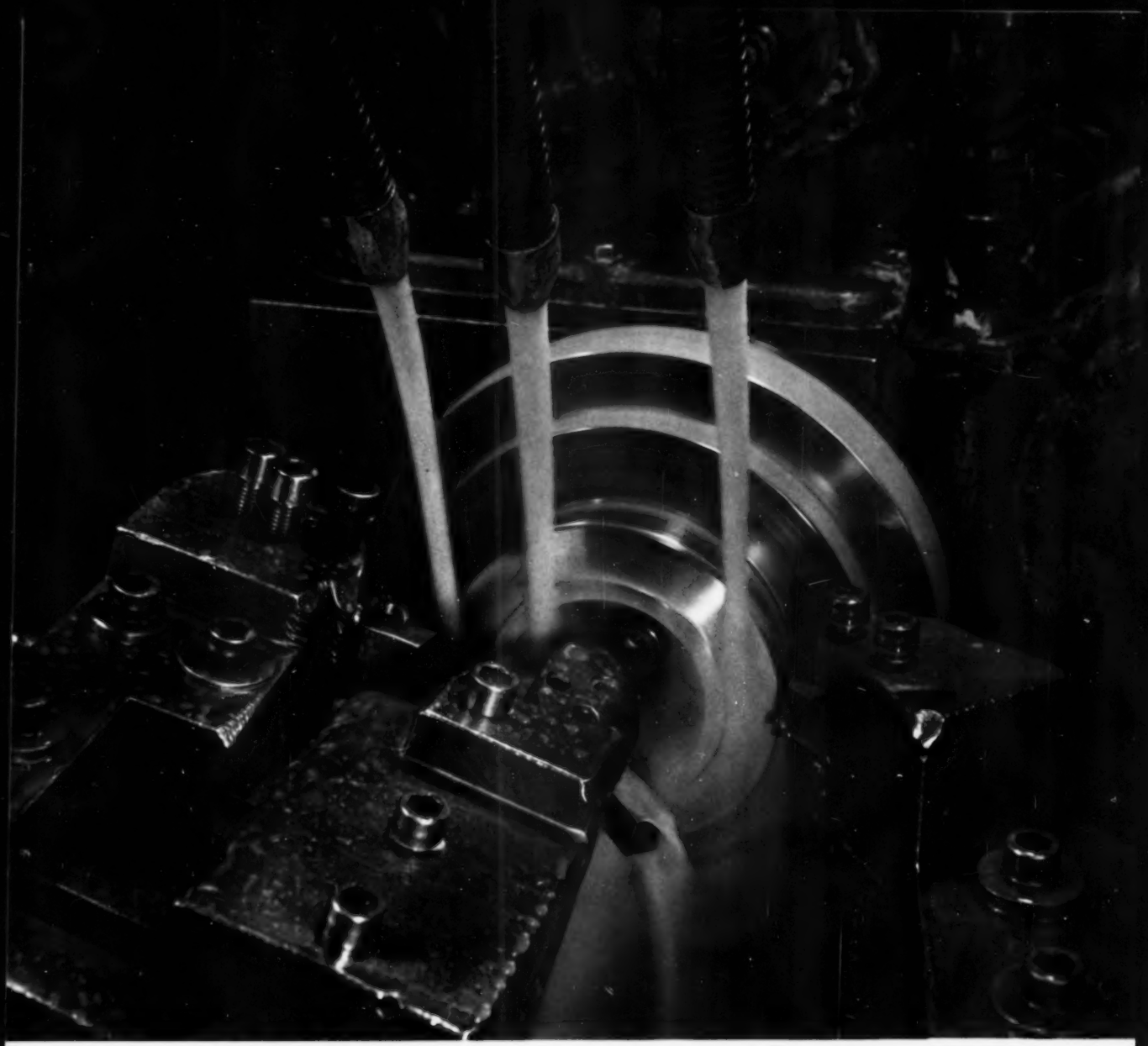


No. 6-18 Hydraulic
SURFACE GRINDER



No. 6-18 Hand Feed
SURFACE GRINDER

BOYAR-SCHULTZ Corporation, 2018 South 25th Avenue, Broadview, Ill.



Improved *Lusol* the coolest coolant of them all

Improved Lusol, an oil-free, transparent, water soluble solution, has the highest heat-removing capacity of all coolants, regardless of type.

This means cooler work pieces and cooler tools; makes possible increased speeds, increased feeds, increased accuracy, better finish and *greatly increased tool life.* Summing it up, Lusol means better production at lower cost.

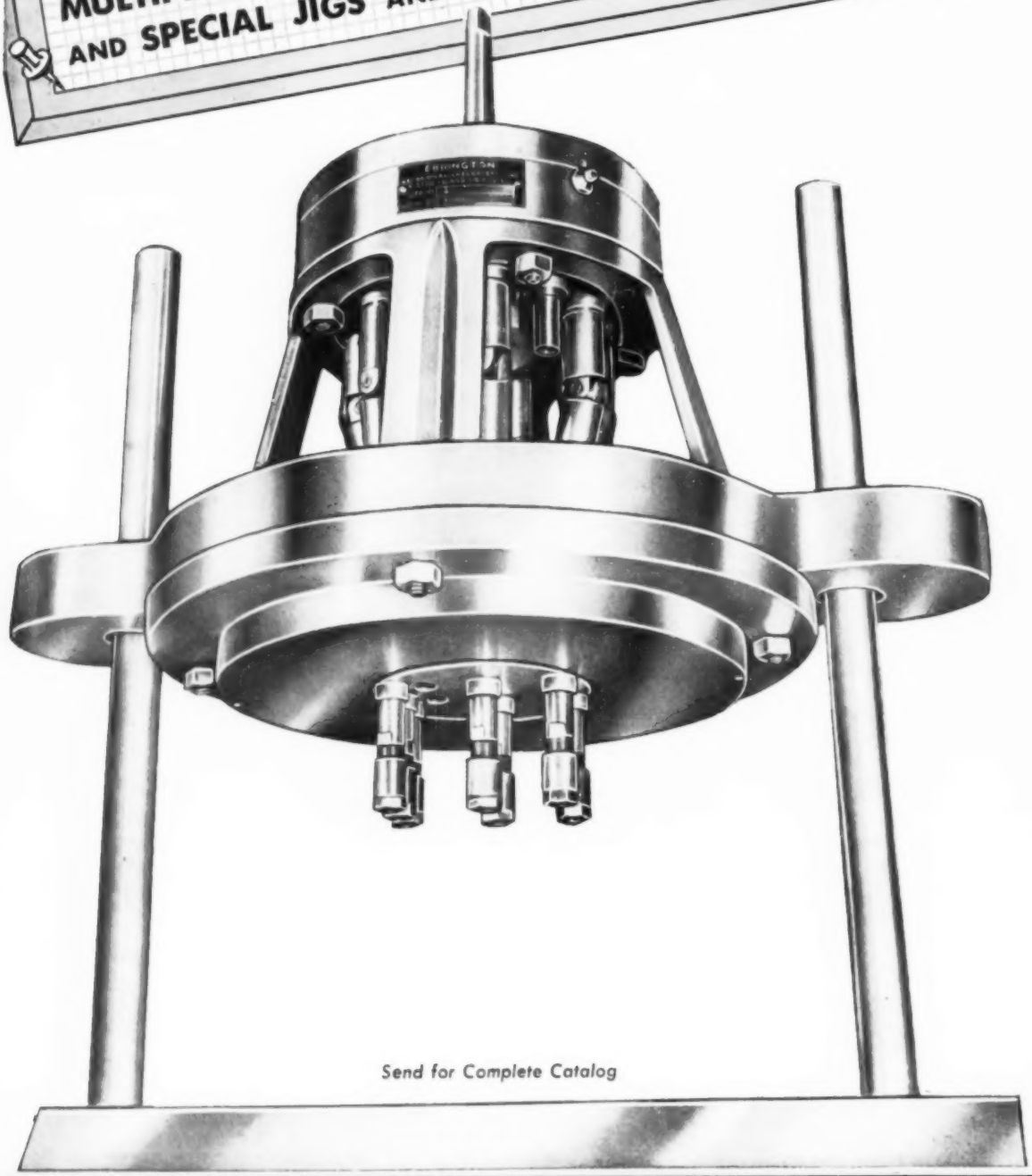
But this is not all–Lusol, an oil-free solution, means cleaner machines and a cleaner plant. It eliminates smell and smoke. It is bland to the hands and cuts out dermatitis. Operators certainly appreciate it. As one said, "I feel as if I were in a new plant–no smell, no smoke, no slippery oily floors–and my wife likes me better when I come home."

Proved for years in hundreds of plants from coast to coast, Lusol is worth investigating NOW. Send for our 16-page illustrated catalog today, describing Lusol and the other Anderson metalworking products.

ANDERSON
OIL and CHEMICAL COMPANY, INC.
BOX 305, PORTLAND, CONNECTICUT
DISTRIBUTORS AND WAREHOUSE STOCKS COAST TO COAST

BETTER PRODUCTS FOR BETTER METALWORKING

DESIGNERS
AND
BUILDERS OF
MULTIPLE DRILLING AND MULTIPLE TAPPING HEADS
AND SPECIAL JIGS AND FIXTURES



Send for Complete Catalog

Established 1891

ERRINGTON MECHANICAL LABORATORY, INC.

24 NORWOOD AVENUE • STATEN ISLAND 4, N. Y.

Field Report . . .

American Can. Division will continue to manufacture and sell plastic and metal tubes and other product lines. Manufacturing operations will continue at the Bradley plant in Maynard, Mass, and the Sun Tube plants in New Jersey.

Weaver Machine Products . . .

. . . Indianapolis, is establishing a screw machine products branch at Hampton, SC. Plant, which will turn out all types of screw machine parts, will begin operations around the first of March.

Hanchett Opening in Alabama

Hanchett Manufacturing Co of Big Rapids, Mich, and Portland, Ore, has opened a new factory branch, warehouse, and office in Birmingham. Facility will stock company products including saw sharpeners, knife grinders, saw swages and swage sharpeners.

New Plating Plant in Tenn

Supreme Plating Co, Detroit, is opening a facility at La Follette. Firm will employ 100 when full production is reached on replating automobile bumpers.

Auto-Lite Boosts Holdings In Crane Co to Over 10%

Electric Auto-Lite Co, Toledo, has acquired an additional 68,100 shares of Crane Co, Chicago plumbing manufacturer. Company now owns 293,300 of the 2,372,624 common shares of Crane outstanding. Crane views the purchase as an investment, says companies have no plans to merge or consolidate.

Fairchild Closing Fla Div

The St Augustine branch of Fairchild Aircraft and Missile Div is in the process of being closed. Company spokesman says move is being made because of "insufficient work load to maintain a profitable organization." Several hundred military aircraft have been repaired, modified, or inspected at the facility since its opening in 1955.

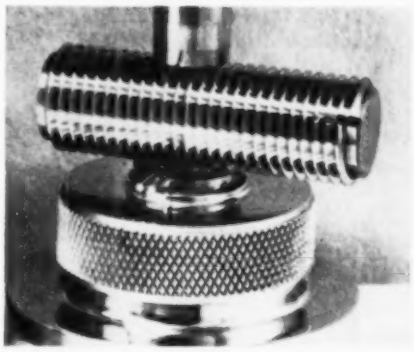
GE Transfers Lexan Project To an Operating Department

General Electric has assigned its Lexan polycarbonate resin project, formerly under the Chemical Development Dept, to the company's Chemical Materials Dept and appointed Dr George E McCullough as

WHY YOU NEED

VK 39th YEAR

CALIBRATED THREAD WIRES



VAN KEUREN STANDARD 60° THREAD MEASURING WIRES ARE NOW CALIBRATED TO WITHIN .000005" OF EXACT SIZE AT NO EXTRA COST.

THIS PREVENTS THE LOSS OF SUBSTANTIAL PORTIONS OF YOUR PITCH DIAMETER TOLERANCES.

CONSIDER

With VK *Calibrated* Wires:
Maximum deviation in wire size as shown on label = .000005"

Maximum error in measurement of 60° Threads due to wire deviation
= .000005" x 3*
= .000015"

For a 3/8-24, Class W, Thread Gage the pitch diameter tolerance is .0001". Thus maximum measurement error using *calibrated* wires is 15% of pitch diameter tolerance.

With *Uncalibrated* Wires:
Maximum deviation in wire size as shown on label = .000025"

Maximum error in measurement due to wire deviation
= .000025" x 3*
= .000075"

Note here that the error in measured pitch diameter using *uncalibrated* wires could be 75% of the total tolerance allowed for the pitch diameter of the 3/8-24, Class W, Thread.

**Change in Measurement for 60° threads = Change in Wire Diameter x (1 + cosec 30°)*

CAN YOU AFFORD TO GAMBLE PART OF YOUR PITCH DIAMETER TOLERANCE ON UNCERTAINTY AS TO THE TRUE DIAMETER OF THE MEASURING WIRES?

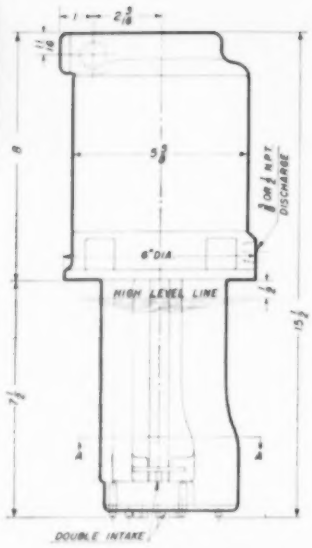
Wouldn't it be a good idea to send us your uncalibrated or worn thread measuring wires for calibration and replacement where necessary? Liberal allowance will be made on uncalibrated wires toward the purchase of new calibrated wires.

VK THE Van Keuren CO.
173 WALTHAM STREET, WATERTOWN, MASS.
Optical Flats . . . Light Wave Equipment . . . Light Wave Micrometers . . . Gage Blocks . . . Wire Type, Taperlock and Trilock Plug Gages . . . Master Setting Disks . . . Thread Measuring Wires . . . Gear Measuring Wires . . . Carbide Plug Gages . . . Carbide Pivots . . . Precision Lapping Service.

Check

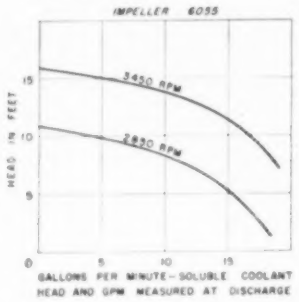
✓ SOUND DESIGN

Designed right, with all the experience that has made Ruthman Gusher Coolant Pumps the leader in their field, Baby Gushers are ideal for machines requiring a nominal volume of coolant.



✓ ECONOMICAL PERFORMANCE

Your Baby Gusher will give you excellent and economical performance on your metal cutting equipment. Pumps up to 25 gallons per minute at 15 foot head. Uses less power when throttled—requires no priming. Coolant flow starts instantly.



✓ LONG LIFE AT MODERATE COST

The original cost of your Baby Gusher is moderate . . . maintenance cost is at an absolute minimum. Prelubricated ball bearings need no further attention. No packing or seals. There are fewer parts to wear. No metal to metal contact.

Model 6-P-3

IMMERSED TYPE

You Get All 3 with a

BABY GUSHER

Other models of Baby Gusher and Tank Unit available.

Write for Catalog.

THE Ruthman MACHINERY CO.

1819 Reading Road, Cincinnati, Ohio

- COOLANT PUMPS
- CIRCULATORS • AGITATORS
- MOLTEN METAL PUMPS

Field Report . . .

manufacturing manager. Transfer is part of GE's plan for continuing development and commercialization of the polycarbonate polymer field. The company is in semi-works production of Lexan resin in Pittsfield, Mass, and is continuing process and product development work in its labs there. Lexan plastic material is tough enough to replace metals for many uses (*AM*—Apr 22 '57, p184).

Lockheed to Assist Mexican Plane Maker

Formation of a new company, to be known as Lockheed-Azcarate, SA, has been announced. Company will be headed by Abelardo Rodriguez, former President of Mexico, and Juan F Azcarate, aeronautical pioneer and engineer.

Initial project will be the manufacture of a light utility airplane capable of performing a variety of civilian and agricultural missions. Design will be aimed at fitting the topographical and geographical requirements of Mexico and other Latin American countries.

Lockheed will assist in the development of the new company through the resources and abilities of its various divisions and subsidiaries. Arrangements have been made with Lockheed's Georgia Division to supply the light-airplane design prototypes and necessary tooling.

Chicago Tool & Die Institute Offering Toolroom Foremen Course

T&DI will offer a course in industrial psychology for supervisors and toolroom foremen of Institute members starting the middle of February. Dr John F Humes, professor of In-

(continued on page 277)

"You'll like the boss . . . around here that's a must!"

CLEVELANDS

automatically set the pace for progress!

Whitin Machine Works, Whitinsville, Mass., builders of textile preparatory machinery and other products, in part of a $4½ million expansion program, has created one of the outstanding screw machine departments in the East. *Sixteen new Cleveland Single Spindle Automatics* (14, Model AB 3" Dialmatics and 2, Cleveland 4¼" Model AW's) are among the facilities that are automatically setting the pace for progress at Whitin Machine Works.

William Steele, Divisional Superintendent, and Eino Johnson, Department Foreman, describe this ultra-modern installation as "one that few companies anywhere can equal. Our machine tool investment includes highly versatile Cleveland Automatics, many with electronic controls, that make possible higher production with still closer tolerances . . in many instances to 0.0005". As has been wisely said, 'you cannot build today's products with yesterday's machines, and still be in business tomorrow'."

Let Clevelands automatically set the pace for progress in your plant. Call in a Cleveland Automatic sales engineer.

THE CLEVELAND AUTOMATIC MACHINE COMPANY

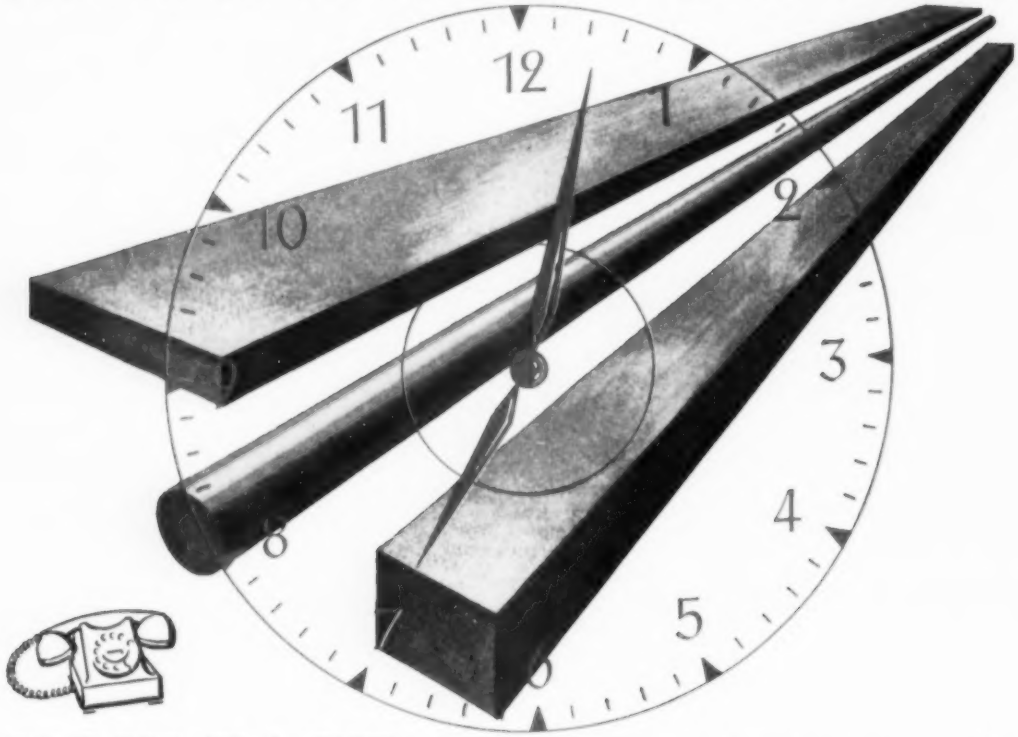
4928 Beech Street
Cincinnati 12, Ohio

SALES OFFICES: CHICAGO
CLEVELAND • DETROIT
HARTFORD • S. ORANGE

Manufacturers of a Complete Line of Single Spindle Automatic Screw Machines and High Pressure Hydraulic Die Casting Machines

Firth Sterling ...

PIONEER IN POWDER AND MOLTEN METALLURGY



HOW FAST do you need the toughest oil-hardening tool and die steel ever made?

INVARO is available—for fast delivery—from Firth Sterling warehouse and distributor stocks of drill rod and ground flat stocks in all practical sizes. It offers tool and die makers consistent uniformity, better hardenability and greater safety in hardening—does a better job in a broad range of applications.

And the INVARO "Twins"—ground flat stock and drill rod—may be heat treated in the same furnace at the same time, exhibiting the same minimum dimensional changes. The resulting savings in time and production can be substantial. For further information, write for free technical bulletin.

INVARO oil-hardening tool and die steel is just one of the many types of electric furnace quality tool steels produced by Firth Sterling. These high quality tool steels are the result of Firth Sterling's continued research and development to provide specialty steels for use in the important tool and die industry.

* * *

If you have a metallurgical problem, powder or molten, we have the answer for it. Please let us hear from you. Firth Sterling, Inc., **Dept. 91H,** 3113 Forbes St., Pittsburgh 30, Pa. Offices and warehouses in principal cities.

"Your Future is Great in a Growing America"

PRODUCTS OF *Firth Sterling* METALLURGY

HIGH SPEED STEELS • TOOL & DIE STEELS • STAINLESS SPECIALTIES • HIGH TEMPERATURE ALLOYS
SINTERED TUNGSTEN CARBIDES • HEAVY METAL • CERMETS • CHROMIUM CARBIDES
ZIRCONIUM • STERVAC & STERCON SUPER ALLOYS

FIRTH STERLING TRADE MARK

dustrial Psychology of the University of Illinois will conduct the class which will last 16 weeks, one night a week, from 7 to 9 at a cost of $60 per enrollee. Course will cover considerations of human behavior; psychological implications in organization and administration; psychology in the operational functions of supervision; and individual development in management and supervision.

Avco Sets Up Nashville Division

Facilities of Avco Manufacturing Corp in Nashville, Tenn, formerly a part of Avco's Crosley Div, are now operating as a separate division. Nashville plant is engaged in engineering and production of aircraft structures and assemblies, Avcomb stainless steel honeycomb panels, components for radar systems, and home appliances. John Mihalic, a Crosley vice president, is president of the new division; total employment will remain at about 3100.

SAMPE For Midwest

Midwest chapter of the Society of Aircraft Materials and Process Engineers has been inaugurated to augment older chapters on the Pacific Coast and on the East Coast. SAMPE is a non-profit organization established to provide opportunity for professional technical people concerned with aircraft materials and processing to add to their knowledge and skills. First meeting, held Jan 12 in Dayton, discussed GE's nickel base super alloy, Rene 41. Information on the society can be had from T J Martin, 2418 Longfellow, Dayton 31, Ohio.

New Plant in Georgia

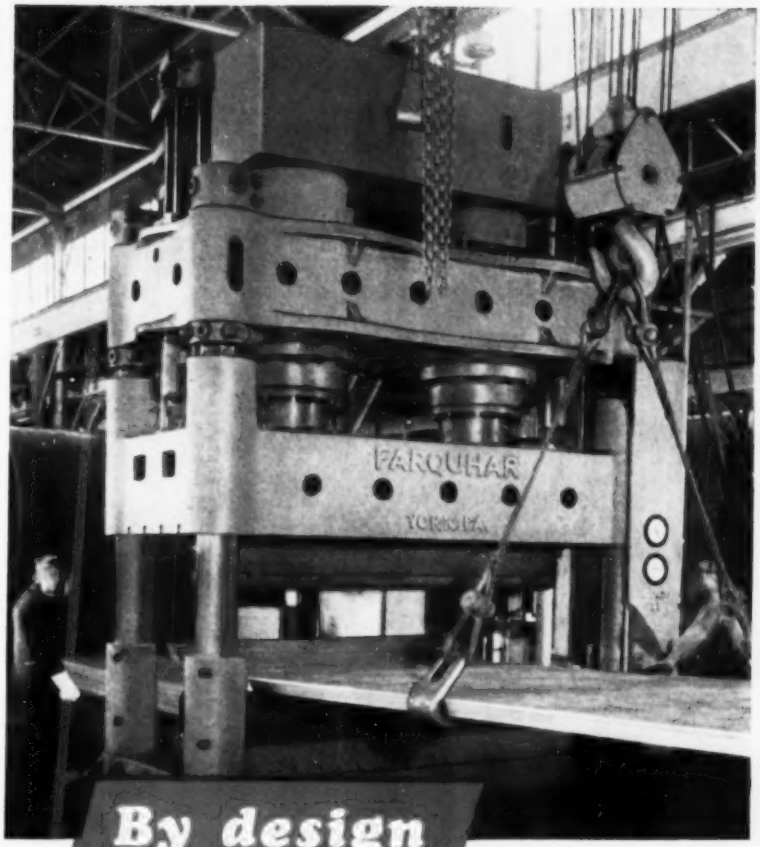
Productive Acres Manufacturing Co, Keota, Iowa, has opened a manufacturing and assembly plant at Jefferson. Firm makes bulk feed units and other types of farm equipment under the tradename Pamco.

Union City, Tenn, Plant . . .

. . . of American Metal Products Co has begun production of seats for the 1959 Ford, Mercury, and Edsel.

Combustion Engineering, Inc . . .

. . . New York, has filed a registration statement with SEC relating to acquisition of General Nuclear Engineering Corp through an exchange of stock, plans to operate it as a subsidiary. Combustion has been active



this OLIVER-FARQUHAR Forming Press will cut your production rejects

By design this 1000-Ton Oliver-Farquhar Four-Column Hydraulic Forming Press has unusually rigid construction. This guarantees minimum deflection under full tonnage loads and close tolerance operation for accurate, high-output production. By design it can be equipped with either manual or electric pushbutton controls. You can select the controls to match your production requirements. By design special high and low pressure fluid circuits are incorporated in this press. Fast advance, controlled pressing and fast return of the rams assure maximum production.

Oliver-Farquhar Hydraulic Presses are available in popular standard sizes from 50 to 5000-ton capacities. O-F Mechanical Gap Presses are available in 75 to 200-ton capacities. You are invited to write, wire or phone for details on these presses or, better still, ask for our proposals or recommendations. And remember, Oliver-Farquhar Conveyors can be designed and built to give you the ultimate in automated loading and unloading for maximum press production.

The Oliver Corporation
A. B. FARQUHAR DIVISION
Press and Special Machinery Departments
York 12, Pennsylvania

OLIVER Farquhar PRESSES

Also Manufacturers of Farquhar Conveyors

CIRCLE 231 READER SERVICE CARD

HIS JOB

....TO BUILD
YOUR PROFITS!

THE *Roto-Finish* CUSTOMER'S MAN

There's nothing unique about stressing product quality. But, at Roto-Finish we have an added incentive. The success of the Roto-Finish Customer's Man *depends* on providing the kind of dependable, mass-production finishing service which builds customer satisfaction, and results in a steady repeat business.

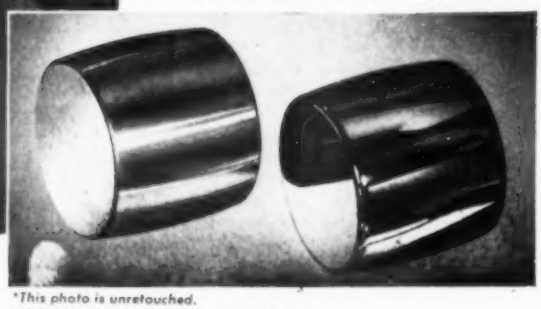
TRIAL AND ERROR FINISHING IS COSTLY

If you're now barrel finishing, our Customer's Man will welcome an opportunity to work with you in your own plant to show you how to get the finish you want, faster, and at lower cost.

If you're hand finishing, he can show you how to save up to 80% of your present finishing costs.

WANT PROOF? Then write or phone your Roto-Finish Customer's Man today.

ROTO-FINISH CASE HISTORY



*This photo is unretouched.

MATERIAL: Bearing steel, 61 Rockwell C Scale.
DIMENSIONS: 1.213" dia. x 1.015".
FINISH BEFORE: Ground to 10 RMS.
FINISH AFTER PROCESSING: 2 to 4 RMS.
(with no dimensional change).

Roto-Finish COMPANY

3723 Milham Road
KALAMAZOO, MICHIGAN
Phone: Fireside 3-5578

ROTO FINISH

FOREIGN REPRESENTATIVES: ARGENTINA—Taller—Buenos Aires ● AUSTRALIA—A. Flavell Ltd.—Cheltenham ● BRAZIL—Commercial E. Industrial de Fornos Werco, Ltd.—Rio de Janeiro ● CANADA—Canadian Hanson & Van Winkle Co., Ltd.—Toronto ● ENGLAND—Roto-Finish Ltd.—Hemel Hempstead ● FRANCE—Societe Roto-Finish—Paris ● GERMANY, AUSTRIA, NORWAY, SWEDEN, SWITZERLAND—Metallgesellschaft A. G.—Frankfurt, a. M.—Germany ● HOLLAND, BELGIUM, LUXEMBURG—N. V. Roto Finish Maatschappij—Delft, Holland ● ITALY—Societa Roto-Finish a R. L.—Milan ● SPAIN—Instituto Electroquimico, S. A.—Barcelona

Field Report . . .

in the nuclear field for more than 12 years and has extensive facilities for design, development, manufacture, and testing of reactor systems, including both light and heavy components. Work now in process at these facilities includes fuel element fabrication, core assembly, and manufacture of a variety of heavy components. General Nuclear is involved in design, engineering, advisory, and R&D services in the nuclear energy field. Dr Walter Zinn, president of GN, will be in charge of all of Combustion's nuclear power activities.

National Stainless Steel . . .

. . . Michigan manufacturer of cookware and other stainless products is setting up a plant in Flora, Miss. Facility will employ 300.

GE's Lynn, Mass . . .

. . . Aircraft Engineering Dept has a million-and-a-quarter-dollar order for J85 engines for T-38 aircraft.

Western Space Age Conference

Second annual conference and exhibit will be held March 5-7 at the Great Western Exhibit Center in Los Angeles. Seven West Coast Chambers of Commerce have joined the LA Chamber in sponsorship of the event which will feature latest wrinkles in the aircraft, missile, and related industries.

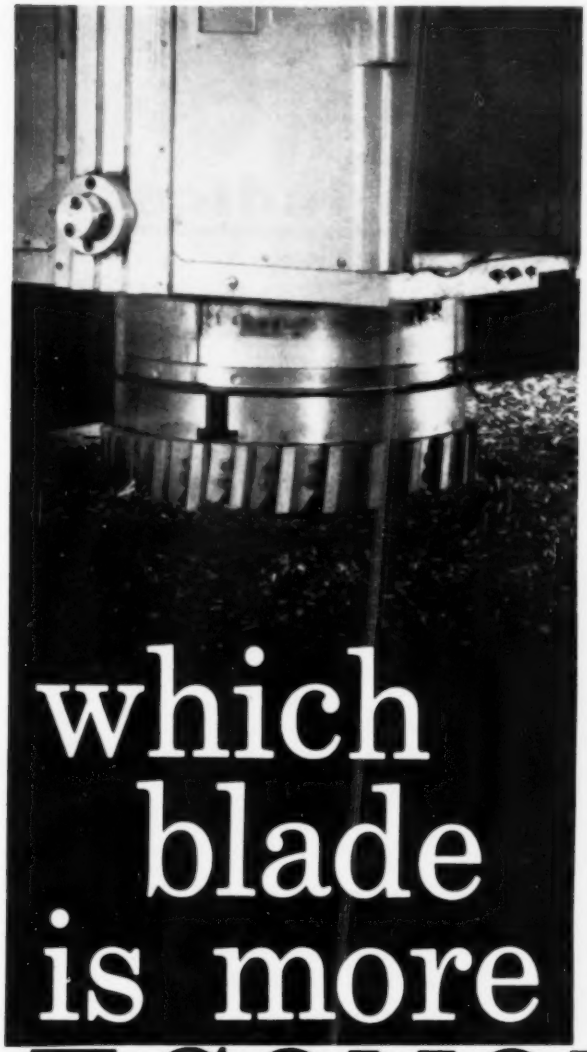
Osco Steel Buys Solar Division

Osco Steel Co, headquartered in Cleveland, has purchased a division of Detroit's Solar Steel Corp. Purchase covers complete warehouse in-

(continued on page 282)

"We have the results of your aptitude test, Fenworth!"

high speed steel or carbide...



which blade is more ECONOMICAL?

Even in the most ordinary milling and boring work, fields of application have a habit of overlapping. And, as a result, choice of the most economical and efficient blade material can often be a challenging problem.

Solutions to machining problems like these are our primary product. You don't buy Ingersoll cutters, as such—or high speed steel or carbide blades. What you buy is lower operating costs and improved finish. You buy increased productivity!

Only after a thorough study of your machine, work piece, depth of cut, speed, feed rates and finish requirements do we recommend any cutter. And we assume full responsibility for every recommendation we make.

We would welcome the opportunity to tell you more about this unique cutter selection service. Write:

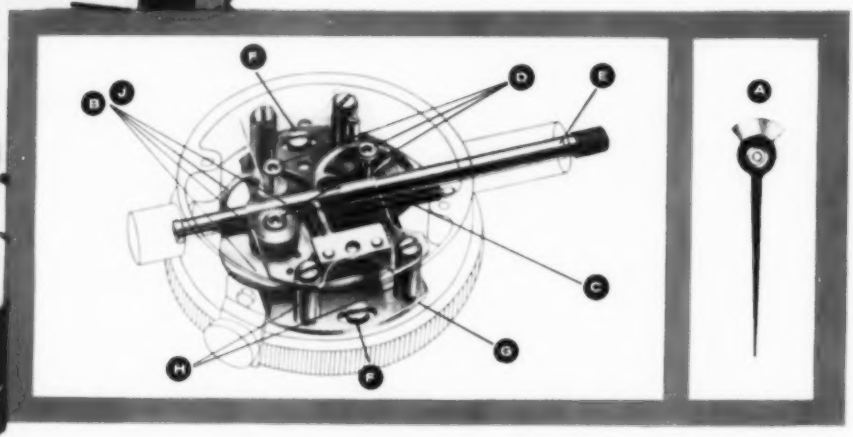
This helpful new booklet tells you how to reduce the cost of chips and improve your milling and boring performance. Ask for a free copy of booklet No.68. K.

THE
INGERSOLL
MILLING MACHINE COMPANY
CUTTER DIVISION
505 FULTON AVENUE • ROCKFORD, ILLINOIS

CIRCLE 233 READER SERVICE CARD

You get all these *Plus Features* only in Federal Indicators

Full Jeweled Bearings, Unit Movement, Low Inertia Indicating Hand, Tough-Hardened Gears — each of these advancements pioneered by Federal has a particular significance to you in terms of better performance. AND with all these *plus* features, Federal Dial Indicators generally sell for LESS due to their wide acceptance which has made possible the economies of quantity production. Here are the features and reasons why they are important:



A **Functionally designed Indicating Hand** balanced for low inertia, provides greater sensitivity and better repeat accuracy. Hand has highest strength-to-mass ratio to preserve position and shape under heavy gaging action.

B **Precision-made, Stainless Steel Gears, Rack and Pinion,** for a rustproof, smoother running, more accurate movement.

C **Positive Contact** with minimum pressure for faithful indicator response.

D **Full Jeweled Bearings** reduce friction, for improved accuracy over a longer period of time.

E **Precision Fit** of spindle and bearing for better repeat accuracy.

F **Accurate Movement Positioning** for optimum rack and gear alignment. Provides extremely close and positive control over a critical fit in *every* indicator.

G **Unit Construction** for easy maintenance and adjustment.

H **Rigid Assembly** of top and bottom plates for accurate gear alignment essential to minimum wear.

J **Tough-Hardened Gears** available optionally on most models for greatly increased life, reduced friction and improved sensitivity.

Ask for your copy of Catalog 58. It describes the full line of Federal Dial Indicators — the world's most extensive line.

FEDERAL PRODUCTS CORPORATION • 9121 Eddy Street • Providence 1, R. I.

Ask **FEDERAL** *First*

for recommendations in modern gages . . .

Dial Indicating • Air • Electric, or Electronic — for inspecting, measuring, sorting, or automation Gaging

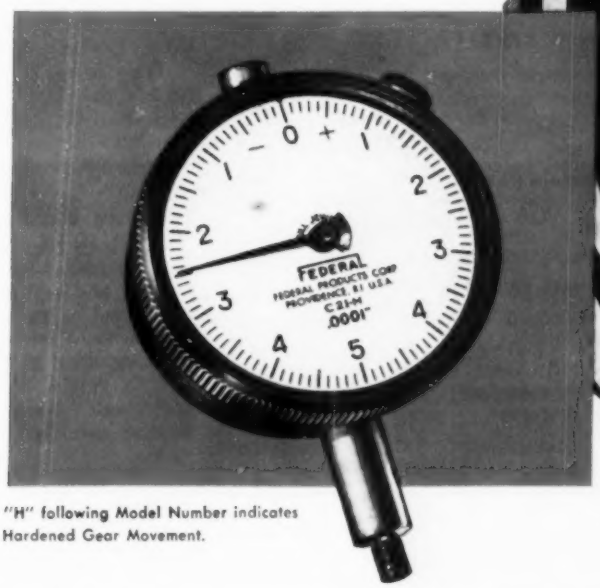
CIRCLE 234 READER SERVICE CARD

Lifetime DIAL INDICATOR

With the

TOUGH-HARDENED

Movement



"H" following Model Number indicates Hardened Gear Movement.

. . . not only tough-hardened, but *precision*-hardened by a special method which greatly increases useful life of vital wear parts (gears, rack and pinion) and improves *performance* as well.

This new hardened gear movement is available on most Federal Dial Indicators.

Comparative tests show that Indicators with hardened gear movements have 16% to 25% less friction, far better repeat accuracy, and greater stability of calibration than regular Indicators. And, since the hardened gear Indicator operates more smoothly, it exerts less contact pressure and provides quicker response to slight dimensional changes, so you have an Indicator of greater sensitivity as well.

Read about this great new development and other Federal Dial Indicators in Catalog 58. Ask for your copy today. **FEDERAL PRODUCTS CORPORATION**
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for recommendations in modern gages . . .

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DO YOU NEED BETTER METAL CLEANERS FOR THESE JOBS?

All the tough jobs are covered by Oakite's booklet on *"Cleaning and preparing metal in aircraft production"*. Just check this list of contents for reminders of operations that give you trouble:

	SEE PAGES
☐ Cleaning aluminum (with or without etching)	2
☐ Preparing aluminum for welding	3
☐ ChromiCoating aluminum before painting	4
☐ Stripping paint from aluminum, steel	5, 9
☐ Barrel finishing aluminum, steel, copper	5, 9, 11
☐ Cleaning magnesium	6
☐ Cleaning steel; derusting and descaling	7
☐ Preventing rust	8
☐ One-operation preparation for painting	9
☐ CrysCoating steel before painting	10
☐ Cleaning copper and its alloys	11
☐ Controlling water in paint spray booths	12

FREE For your copy of this 16-page illustrated booklet, write Oakite Products, Inc., 24 Rector Street, New York 6, N. Y.

SPECIALIZED INDUSTRIAL CLEANING
OAKITE
MATERIALS · METHODS · SERVICE
SCIENCE
In our 50th year

Technical Service Representatives in Principal Cities of U. S. and Canada

Export Division Cable Address: Oakite

Field Report . . .

ventory (except flat rolled products including strip, hot and cold rolled sheets and light plates); hot and cold rolled carbon and alloy bars, drill rod, tubular, structural, heavy plates, plus collateral equipment relative to these products. Osco just recently bought a former Murray Corp of America plant in Detroit, has started a half-million-dollar remodeling program on this 136,000 sq ft site.

Metals & Controls to Merge Into Texas Instruments

Directors of Texas Instruments Inc, Dallas, and Metals & Controls Corp, Attleboro, Mass, will recommend proposed merger plan to their stockholders early this year. Merger would be through exchange of stock. Texas, with sales in excess of $90 million for 1958, employs 7500 in the manufacture of electronic and electro-mechanical systems; Metals & Controls (sales, $45 million last year, payroll of 3000) makes clad metal products, thermostatic controls, and provides nuclear fuel elements and cores to the Navy and industry.

Tennessee Waltz

Chattanooga Royal Co, manufacturer of portable barbecue grills, gas heating, and central air conditioning equipment, is merging with Gray & Dudley Co, Nashville producer of a complete line of built-in gas and electric stoves, water heaters, and appliances. Headquarters of the merged operation will be in Nashville.

Firestone Corporal Contract

Firestone Tire & Rubber Co, has a $5.8 million Army Ordnance order for continued production of Corporal guided missiles. Company has been making the surface-to-surface guided ballistic missile (only one of its kind in operational use by US armed forces) at its Los Angeles plant since 1951.

Willys Motors Gets Orders For Cargo-Personnel Carriers

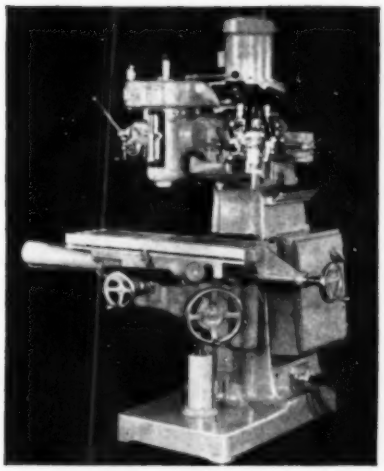
Contract to build four more prototype XM443E1 ¾-ton convertible carriers has been awarded by Cleveland Ordnance District to Willys Motors Inc, Toledo. Vehicle is the outgrowth of further development of the M274 Mechanical Mule, a ½-ton platform-design weapons carrier now being turned out by the company for both the Army and Marine

INCREDIBLE? NO!

THESE SAVINGS ARE REAL

GORTON MACHINE TOOLS,

both standard and custom-designed, are today *paying for themselves in record time. Here are just three typical examples:



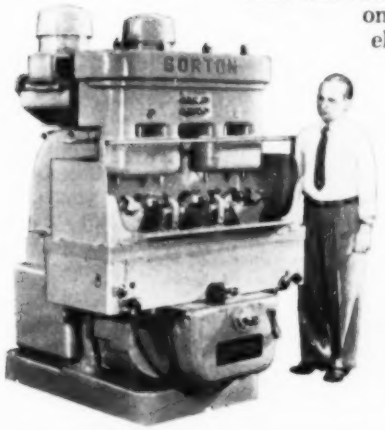
from **8 Hours** per piece to **5 Minutes** per piece

This standard Gorton Trace-Master Hydraulic Duplicator was purchased to profile a complex part from a simple master. Previous cost of this operation was $102.40. Present cost with this Gorton machine is $1.07. Saving per piece is $101.33.

*Cost figures were arrived at by using $2.80 per hour for operator's time and $10.00 per hour, Machine rate.

cost saving per piece . . . **$1,139.20**

This Gorton Horizontal Mill with special holding fixture, tooling, hydraulics, etc., was purchased to machine thirty-five impeller blades from the solid, involving compound curvatures, thicknesses and depths. Former production time was one piece in 100 hours. Present time on this new machine is one piece in eleven hours. Machine was paid for after machining 22 pieces.



$50,000 machine pays for itself in **41 Weeks**

This Gorton 4-spindle "Automatic Cycle" Duplicator was purchased to mill out recesses in a round steel part. Original production time on a manually operated single spindle duplicator was 60 pieces per hour. Present production on this new machine is 204 pieces per hour. Cost saving is 71%.

Cost reduction and improved accuracy are important to you today. We shall be glad to analyze your needs and make specific recommendations on request.

Your letterhead inquiry will receive prompt attention.

GORTON

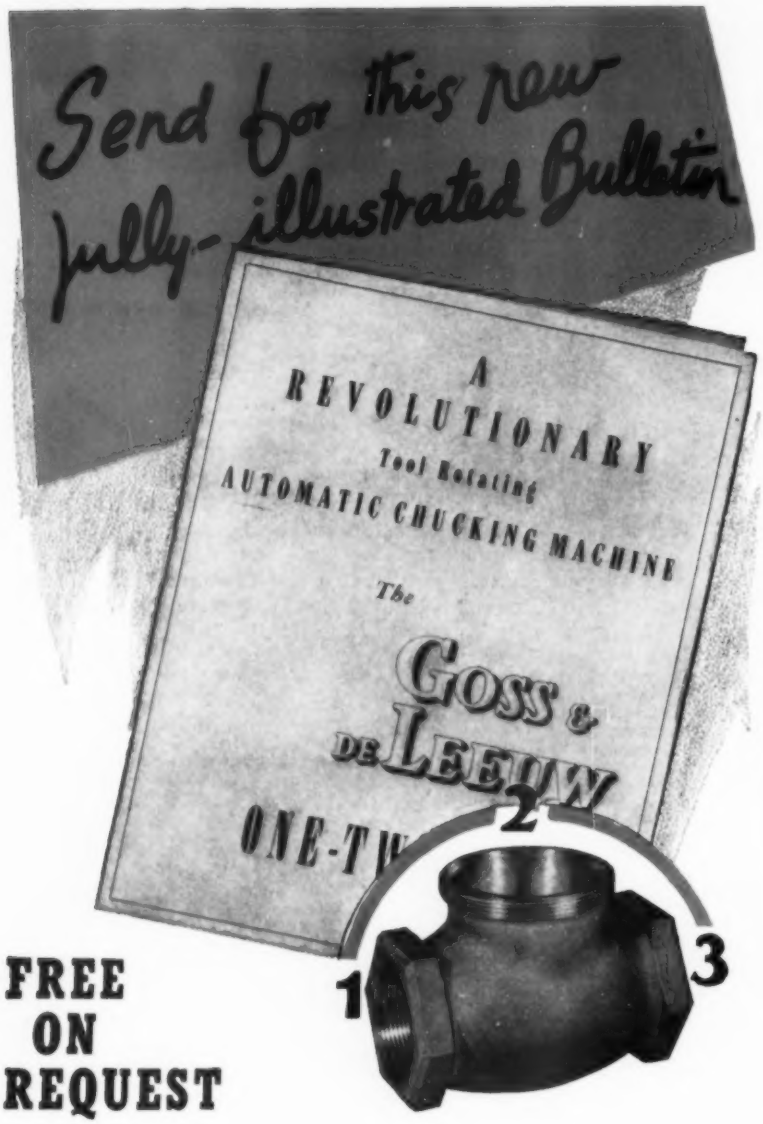
GEORGE GORTON MACHINE CO.

1501 Racine Street • Racine, Wisconsin

SINCE 1893

Tracer-Controlled Pantographs, Duplicators — standard and special . . . Horizontal and Vertical Mills, Swiss-Type Screw Machines, Tool Grinders, Small Tools and Accessories.

A8-1012



FREE ON REQUEST

Here are the answers to most of your questions as to what "ONE-TWO-THREE" means in describing this outstanding development of Automatic Chucking Machines by Goss and De Leeuw. You'll be interested not only in the revolutionary design of the machine itself, but also in its extraordinary performance—and how it is possible to handle from one to three operations—in sequence or simultaneously without changing set up.

Get this interesting, informative Bulletin NOW—by merely asking for it.

GOSS and DE LEEUW
MACHINE COMPANY, KENSINGTON, CONN., U.S.A.

GOSS & DE LEEUW

Field Report . . .

Corps. The four lightweight tactical vehicles will be delivered to the Army Ordnance Corps in March for evaluation tests.

Ryerson Enters Texas

Joseph T Ryerson & Son, Chicago-based steel distributing subsidiary of Inland Steel Co, has taken over the Dallas and Houston plants and stocks of Vinson Steel & Aluminum Co. Transaction was through undisclosed amount of exchange of stock. Both of the newly acquired plants are equipped with plate and sheet shears, hacksaws, flame cutting machines, coil slitting and cut-to-length lines, and provide a complete service on steel and aluminum cut to customer requirements.

Hi-Precision Buys Sales Rights To Deltronic Gages

Hi-Precision Grinding, Inc, of Costa Mesa, Calif, has integrated production and marketing of Deltronic Tenth Plug Gages and Micro-Balls. All patents and sales rights have been purchased by the company which has been manufacturing both products for Deltronic for the past three years. Hi-Precision plans immediate expansion of its gage department.

ACF Closing Buffalo Plant

ACF Industries, Inc, will close its Buffalo plant at expiration date of present contracts because of increasing difficulty in procuring new business since a prime contract from the Atomic Energy Commission terminated in November. In addition to AEC work, the plant made missile launchers and handled ordnance contracts. Part of the Nuclear Products-Erco Division, the Buffalo facility currently employs 400.

Markem Sets Up New Division To Serve Mechanical Industries

Markem Machine Co, Keene, NH, maker of marking machines, type, and ink, has established a new division that'll handle sales and service of company products to manufacturers of transportation equipment, packaging materials, fabricated wood, plastic and metal products, ceramics, instruments and graphic arts. Firm will offer to these industries machines and supplies for identification and decoration of products, packages, and labels.

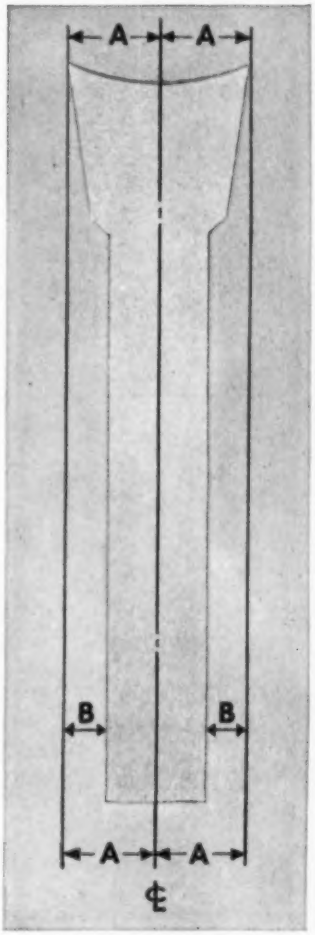
CLEVELAND

Improved MO-MAX® GROUND T-SHAPED CUT-OFF BLADES

can REDUCE YOUR COSTS on all types of cutting-off, grooving and finning operations

MO-MAX High Speed Steel, carefully heat treated by the most modern methods and equipment, provides superior cutting qualities . . . produces *more cuts per grind.*

MO-MAX COBALT High Speed Steel gives best results under difficult conditions . . . has a high degree of red hardness.



The head and body of every blade are ground to close tolerances with reference to the center line, resulting in accurate uniformity and interchangeability.

A new method of grinding these T-shaped Cut-off Blades assures extremely high accuracy in all dimensions. Head and body are always equidistant from the center line. This provides complete interchangeability, and saves costly set-up time.

The top of each blade is ground with a radius, so that the chips are crimped. Chips are narrower than the blade itself, resulting in a cooler running tool, less scoring on the sides of the cut and easier application of coolant.

Try MO-MAX or MO-MAX COBALT T-shaped Cut-off Blades on *your* next job and see how their superior performance reduces your costs. Contact our nearest stockroom or . . .

TELEPHONE YOUR INDUSTRIAL SUPPLY DISTRIBUTOR

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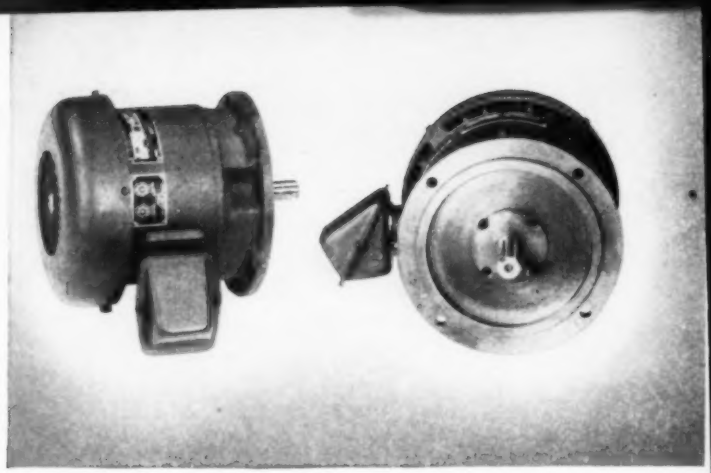

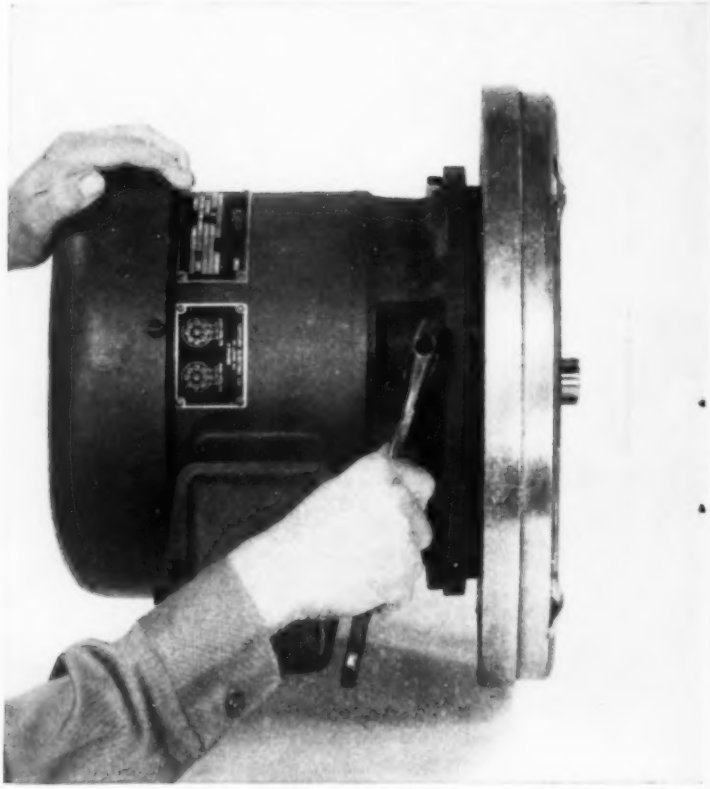

It's smaller. . . easy to mount . .

This is *not* simply a rerated motor. The Century Electric short motor is a standard motor available in ratings up to 15 hp, but . . . it has been redesigned to cut down length as much as four inches. It is designed to save space and weight for application on machine tools, roof ventilators, pumps, centrifuges and many other types of equipment.

Easy to mount: You can use this motor in place of any end-mounted motor because it has a standard flange. It can also be mounted horizontally, vertically or at any angle. Its small size means it can be mounted almost anywhere on equipment.

CIRCLE 240 READER SERVICE CARD

.lighter . . . *The Century Electric short motor*

Variety of applications: The short motor gives dependable performance on applications requiring frequent start-stop operation. You can get it in totally enclosed or open frames. And it has the same quality features and high standards of all of Century Electric's complete line—up to 400 hp.

More than a motor: This motor is the result of a continuing search for ways to meet industry's needs. Another reason why you get *more* than a motor from Century Electric.

For more details contact your nearest Century Electric Sales Office or Authorized Distributor.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

CIRCLE 241 READER SERVICE CARD

Century

58-14

NILSON 4-SLIDE TAKES A TOUGH ONE . . .

Mass production of body trim clips for a leading make automobile proved a complex forming problem. A. H. Nilson's 4-Slide (Model S-4-T) did the job, forming .025" x 3", 1065 C.R.A. steel at 54 strokes per minute! Accurate, fast, and automatic, Nilson 4-Slides keep pace with one of the nation's biggest industries.

THIS ONE WAS EASY . . .

A Nilson 4-Slide, Number 1, forms 150 drapery hooks per minute from 0.70 basic steel wire. Nilson 4-Slides form wire or ribbon stock from the coil. They straighten, feed, pierce, blank, swage, stamp or coin, cut and form in one, fast, automatic operation . . . accommodate wire up to .5" dia., in feeds to 32" max., and ribbon up to 3.5" wide. Press sections from 5 to 75 tons.

A. H. Nilson provides forming recommendations from detailed information without obligation. Send for catalog.

A.H. NILSON MACHINE COMPANY

601 BRIDGEPORT AVENUE, SHELTON, CONN.

Automatic Chain Making Machines : Staple Forming Machines : Wire and Strip Reels : Wire Straightening Equipment : Slide Feeds for Presses

Free Literature

To order any of these bulletins, circle corresponding number inside back cover.

MACHINES AND ATTACHMENTS

1 THREAD ROLLING MACHINE — *Reed Rolled Thread Die Co, 791 Main St, Holden, Mass.* 8-page bulletin B111-1 gives detailed data on Model B111 two-die type horizontal cylindrical die thread rolling machine for either large or small quantity production. Illustrates and describes both in-feed and thru-feed thread and form rolling performed with standard unit. Variety of typical parts threaded or formed are pictured.

2 LANROLL THREAD ROLLING ATTACHMENTS—*Landis Machine Co, Waynesboro, Penna.* 30-page illustrated bulletin I-400-2 containing parts list and operating instructions has been revised to include dimension charts of each diameter and pitch, max bar and hex bar sizes, penetration rates, etc, for bolt, straight pipe and taper pipe applications for the five sizes of attachments. Additional section shows applications of the attachments to each of the popular sizes of automatic screw machines and turret lathes.

3 AUTOMATIC CUTTING MACHINES — *Motch & Merryweather Machinery Co, Wink Cutter Div, 1850 E 222nd St, Cleveland 17, Ohio.* 8-page bulletin W-100 illustrates and describes Wink high-speed automatic rubber and plastic cutoff machines and equipment. Specifications and accessories included.

4 ABRASIVE HARD GEAR FINISHER—*Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich.* 4-page bulletin 999 pictures and describes new process for correcting heat-treat imperfections (nicks, burrs, scales, etc), of external gears, and the Michigan-developed machine to do the job. Covers machine construction and specifications, finishing tools, and optional (interchangeable) equipment for finishing internal hard gears.

5 TAPE-CONTROLLED COMBINATION MACHINE—*Kearney & Trecker Corp, 6300 W National Ave, Milwaukee 14, Wis.* Illustrated bulletin TG-59 gives data on the Milwaukee-Matic that provides milling, drilling, reaming, tapping, and boring operations on parts produced by the small and medium-lot manufacturer. Tape control system requires no computer or director yet it can approximate contour by milling combinations of straight lines, angles, and true radii. It will position to high accuracy for boring as well as drilling and tapping. Selection of the 8-table index positions and the preselection of any one of 31 tools from an automatic tool-change magazine is provided. Advantages, features, specifications included.

"Say, how long does a fella have to work here before he falls into a deal like this?"

New accomplishment in automation with new Logamatic 410

automated turret lathe with air-hydraulic cross slides

Cross slide control panel

Spindle and turret control panel

- Electric power-turret feed
- Automatic cycling
- Adjustable rapid travel
- Variable-rate turret feed
- Variable-rate cross slide feed
- Variable-speed drive
- Pushbutton control
- Available as bar-feed machine
- L-O spindle nose

Only the Logan Logamatic 410 offers so many features in its price range! Swing over bed, 14⅝". Swing over cross slide, 6⅞". Spindle bearings: (4) ABEC Class 7. Speed range, 25 to 2,000 rpm. Two-speed, 3-1½ hp. Dinabrake motor & controls: standard equipment.

FOR COMPLETE INFORMATION AND PRICES CONTACT THE FOLLOWING DEALERS

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746 North Fourth Street
Minneapolis, Minnesota

J. M. Grisley Machine Tools
334 W. Seventeenth South St.
Salt Lake City, Utah

Hoffman and Heartt
Home Office
3005 S. Grand Avenue
Los Angeles, California

Richard Ives Company
West Colfax at Welton St.
Denver, Colorado

The E. A. Kinsey Co.
Home Office
327-335 W. Fourth Street
Cincinnati, Ohio

T. S. McShane Co.
1113 Howard Street
Omaha, Nebraska

Moore Machinery Co.
Home Office
7th and Carleton Sts.
Berkeley, California

Neff, Kohlbusch & Bissell, Inc.
Home Office
5700 W. North Avenue
Chicago, Illinois

Peninsular Machinery Co.
19178 James Couzens Highway
Detroit, Michigan

Robert R. Stephens Machinery Co.
Home Office
8145 Olive Blvd.
St. Louis, Missouri

LOGAN ENGINEERING CO. Dept. G-159, 4901 Lawrence Avenue, Chicago 30, Illinois

How to make both ends meet . . . and still cut finishing costs!

Time was when abrasive belt joints raised a rough problem in finishing circles. The early overlapping joints caused belts to rotate unevenly, chatter and mar freshly finished surfaces. Not so now! Today, Jewel Brand "Velvet Joints" have put the "smooth" back in smoothing operations. Jewel Brand Belt ends are neatly blended to form velvet smooth joints which permit an even flow of cutting surfaces and eliminate jumping. The result is a smooth, uninterrupted action that speeds up grinding, finishing and polishing . . . helps keep product finishing costs in line. A Jewel Brand Engineer will be glad to demonstrate these superior belts in action in your plant without obligation. Arrange for a free demonstration now. Write Abrasive Products, Inc., **561** Pearl Street, South Braintree 85, Massachusetts.

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COATED ABRASIVES

ABRASIVE PRODUCTS, INC., South Braintree 85, Massachusetts

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6 UNIVERSAL HOBBER—*Lees-Bradner Co, Cleveland, Ohio.* 12-page brochure presents illustrated description of the Dowding H.7 designed for rapid production of gears integral with long shafts, long splines, and high helix angles. Design features, workholding equipment, forms that can be hobbed, specifications, and optionals covered.

TOOLS AND ACCESSORIES

7 PRECISION TOOLS — *Brown & Sharpe Mfg Co, Industrial Products Div, Providence 1, RI.* 20-page bulletin M81 contains illustrated data on line including convertible thimble micrometers with range from 0 to 1 in. by 0.0001 in.; height gages with added versatility; Super Hite Chek, self-contained transistorized unit that reads in 25 millionths; tool setting gages; edge finders; radius gages; sine plates; dial snap and bore gages; permanent magnet chucks; and precision ground tool steel. Specifications and prices included.

8 CUTTING FLUID—*Cincinnati Milling Machine Co, Milling Products Div, Cincinnati, Ohio.* 12-page brochure PC-359 contains detailed information on Cimcool Cimperial, a solution for heavy-duty metal cutting. Product, a chemical solution, is said to effectively cover 95% of all cutting jobs. This water-soluble fluid is reportedly capable of performing the tough, low clearance-low speed operations previously limited to cutting oils. Features and advantages discussed; operational details tabulated.

9 POWER LUBRICATION SYSTEMS *Lincoln Engineering Co, 5703-27 Natural Bridge Ave, St Louis 20, Mo.* 32-page catalog 81 contains information on complete line of lubricant application equipment, fittings, and accessories. Includes descriptions of automatic centralized systems, semi-automatic, and manual methods of lubricating machines. Application can be made on any kind of machine that has a bearing surface that requires a lubricant.

10 ADJUSTABLE VIBRATING FEEDERS—*Arthur G Russell Co, Forestville, Conn.* Illustrated bulletin 5807 gives data on feeders, available in four sizes, that are energized by from three to six magnetic motors called Vibro Blocks. Base diameters of feeders range from 12 to 30 in.; clockwise and counterclockwise bowls feed a variety of parts at speeds up to 80 fpm.

11 PUNCHES AND DIES—*F J Stokes Corp, Punch & Die Div, 5500 Tabor Rd, Philadelphia 20, Penna.* 4-page illus-

"Almost didn't make it this morning. I've got the mumps."

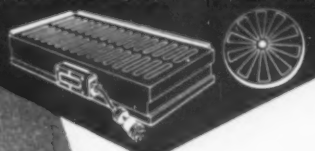
World's largest, most complete line of permanent and electro-magnetic and vacuum chucks

Walker Chucks are designed and engineered to give efficient and completely dependable performance in all applications. The incomparable combination of structural and operating features makes Walker Chucks your best buy in every way.

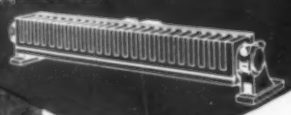
Walker permanent magnetic chucks utilize ceramic magnets which have *three times* the coercive force of alloy magnets. Rectangular chucks are available in 6 stock sizes, 6 x 10" to 12 x 24"; rotary, from 4" to 6" dia.

Small, thin work is easily handled with Walker bar pole electro-magnetic chucks. Rectangular in 81 sizes, from 6 x 12" to 30 x 96".

Holding jigs and fixtures are eliminated when you use Walker electro-magnetic chucks. Rectangular in 72 stock sizes, from 4 x 8" to 30 x 96"; rotary, from 6" to 36" dia.



In addition to the extensive range of stock sizes of permanent, electro-magnetic, and vacuum chucks and holding fixtures, Walker is your best source for "specials" for specific applications.

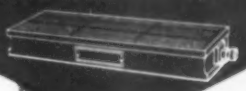


Walker has long been the leader in the field of demagnetizers. Stationary, hollow core demagnetizers are made to order in any size and shape of gap from 1" square up.

For complete information on the entire Walker line, write for Catalog No. 58.

O. S. WALKER COMPANY, INC.
WORCESTER 6, MASSACHUSETTS, U. S. A.

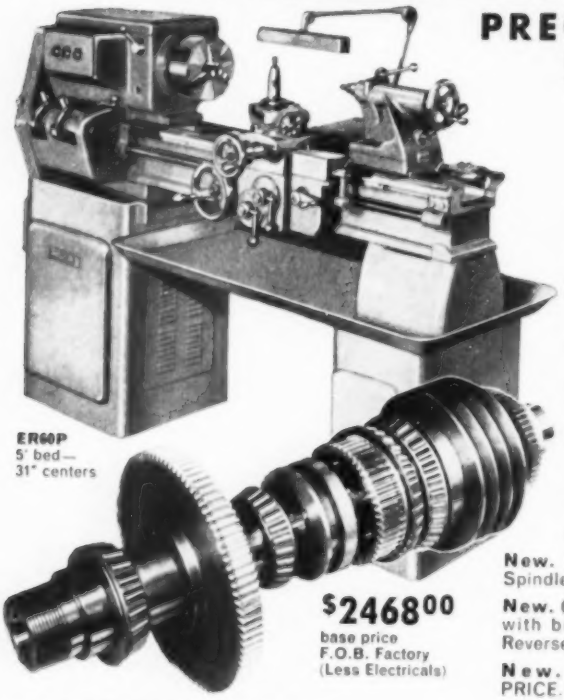
Walker vacuum chucks for holding non-ferrous parts are made to order in any desired size and shape. Favorites in the aircraft industry, they solve the problem of holding non-ferrous sheet stock. From 4" dia. to 10 ft. x 24 ft.



O. S. Walker

O. S. Walker—The Original Designers and Builders of Magnetic Chucks!

Both NEW *and* DIFFERENT SHELDON 15" PRECISION LATHES



ER60P
5' bed—
31" centers

NEW

New. Revolutionary double-box Headstock (Pat. Pend.)

New. "WORK-HOLDING-ONLY" Spindle.

New. Single-Shift Back Gear Lever on Headstock.

New. Headstock and Apron running in oil.

New. 1⅛" Hole through Spindle.

New. 60-pitch Gear Box with built-in Lead Screw Reverse.

New. Amazing LOW PRICE.

$2468.00
base price
F.O.B. Factory
(Less Electricals)

DIFFERENT

Different. Spindle rigidly held in two large "Zero Precision" tapered roller bearings arranged in new box-type design.

Different. Electrical switches and push-button stations fully enclosed in built-in well in headstock.

Different. Two independent clutches in apron for selecting power feeds.

Different. Cam-action tailstock clamp for rapid release and instant locking of tailstock.

Different. Triple, cogged, V-belt outboard drive—eliminates intermediate shafts—delivers more power to spindle.

This is an all new lathe that bridges the gap between conventional belt driven and geared head lathes. It combines the capacity and power of a geared head with the economy and flexibility of a belt driven lathe. Available with 5', 6' and 8' bed lengths providing 31", 42" and 66" center distances.

Send in Coupon for full information

SHELDON MACHINE CO., INC. 4234 No. Knox Ave., Chicago 41, U.S.A.

Gentlemen: Please send me information on items checked.

- ☐ The NEW and DIFFERENT SHELDON 15" Lathes
- ☐ Sheldon ☐ 10" ☐ 11" ☐ 13" Lathes
- ☐ 11" and 13" Variable Speed Lathes
- ☐ High Speed Turret Lathes
- ☐ Sebastian 13" and 15" Geared Head Lathes
- ☐ Horizontal Milling Machine
- ☐ Sheldon 12" Shaper
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Name Title

Company Name

Street Address: ☐ Company ☐ Home

City State

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trated bulletin 450 includes punch and die interchangeability tables for rotary tablet presses; sizes and styles normally carried in stock.

12 CUTTERS—*W F Meyers Co, Bedford, Ind.* Catalog covers carbide-tipped and solid carbide cutters for slotting, slitting, cutting, or forming a wide variety of materials.

13 DECIMAL EQUIVALENT CHART —*Ohio Seamless Tube Div of Copperweld Steel Co, Shelby, Ohio.* 8½ x 11-in. chart printed on heavy, coated white card stock lists fractional units from 1/64 to 1 in.

14 COORDINATE COMPARATOR — *Gaertner Scientific Corp, 1201 Wrightwood Ave, Chicago 14, Ill.* Bulletin 181-58 describes instrument and its accessories. Applications include measuring X-ray plates, spectrograms, and similar records on photographic plates, as well as inspecting and measuring tools, dies, mechanical parts, and other opaque objects. Precision measurements can be made in either rectangular or polar coordinates.

15 PNEUMATIC TEMPERATURE CONTROLS — *Partlow Corp, 509 Campion Rd, New Hartford, NY.* 4-page folder describes new line of indicating and recording models that operate in any of 10 optional temperature ranges from −30 to +1100 F. Both Models IVA and RVA operate on an air pressure of 3 to 15 psi.

16 SURFACE PLATE CHECKER — *Herman Stone Co, 1380 N Gettysburg Ave, Dayton 27, Ohio.* Bulletin 102 describes and illustrates Tol-Check, an instrument for checking tolerance accuracy of surface plates. Deviations are indicated on a dial. Accurate evaluations can be made in 30 sec.

HEAT TREATING AND WELDING

17 RESISTANCE WELDING—*Federal Machine & Welder Co, Warren, Ohio.* 28-page bulletin PP-54 illustrates and describes process in all phases—spot, projection, seam, flash, etc. Discusses basic principles; includes a resistance welding formula, data on how to calculate pressures, time in cycles, current in secondary am-

"Why can't your kid go over to the playground?"

CARBIDE DIE DRILL NO. 1500

Reduce Tip Failures with W & B Perma-Braze Carbide Tools

CARBIDE DOWEL PIN REAMER NO. 1289

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Perma-Braze is an advanced process pioneered and perfected by Whitman & Barnes that enables carbide tips to be brazed with a specially developed high temperature alloy at the same time the high speed bodies are hardened. The result is uniform body hardness and carbide tips that will not loosen due to braze melting. Your payoff is greatly reduced tip failures . . . less machine down-time . . . longer tool life. You get lower tooling costs *and* a more efficient operation. Ask your W&B distributor about Perma-Braze carbide tools today!

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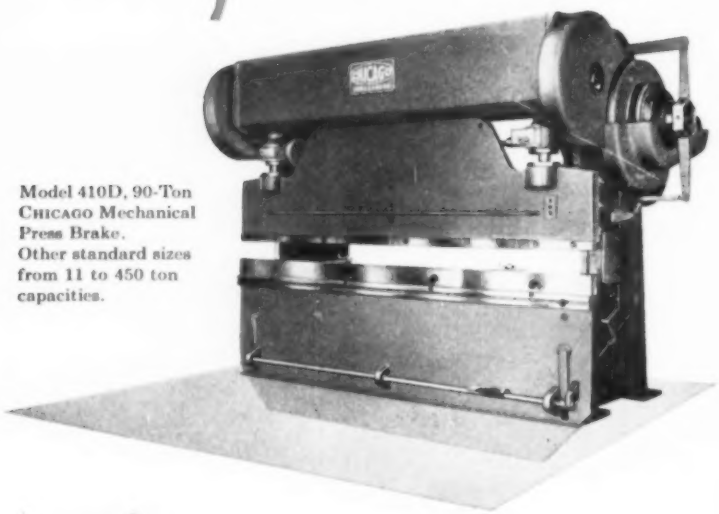
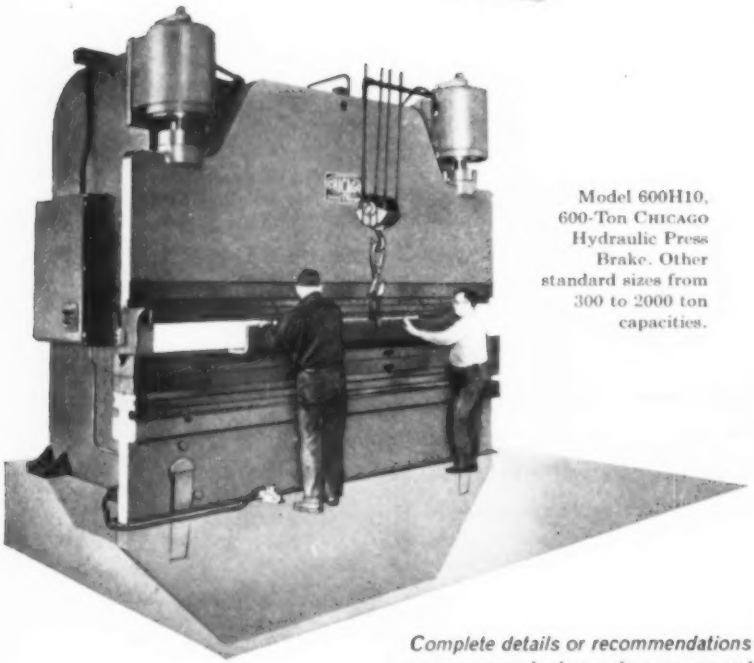
CHICAGO® PRESS BRAKES

unexcelled accuracy / ***for sheet metal and plate work***



Model 410D, 90-Ton CHICAGO Mechanical Press Brake. Other standard sizes from 11 to 450 ton capacities.



Model 600H10, 600-Ton CHICAGO Hydraulic Press Brake. Other standard sizes from 300 to 2000 ton capacities.

Complete details or recommendations on any press brake work upon request

8439

Press Brakes
Press Brake Dies
Straight-Side-Type Presses
Hand and Power Bending Brakes
Special Forming Machines

DREIS & KRUMP MANUFACTURING CO.
7434 S. Loomis Blvd., Chicago 36, Illinois

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peres, tip diameter, plus pertinent information on welding a wide variety of materials.

18 WELDED ASSEMBLIES—*American Welding & Manufacturing Co, 600 Dietz Rd, Warren, Ohio.* 60-page catalog presents illustrated information on typical assemblies produced; covers material, size, weight, manufacturing processes, and testing requirements. Lists 94 materials that Amweld has successfully welded and can fabricate on a production basis.

19 NICROBRAZ CEMENT—*Wall Colmonoy Corp, Stainless Processing Div, 19345 John R St, Detroit 3, Mich.* 2-page data sheet No. 7 discusses product for use in applying brazing alloys for high-temp service. Describes composition, properties, and applications. Includes chart showing approx Zahn viscosity numbers for six different thicknesses of the cement. Use as a binder for Nicrobraz White Stop-Off also discussed.

20 CAST IRON BRAZING—*Handy & Harman, 82 Fulton St, New York 38, NY.* 4-page bulletin 80 contains data on brazing alloys, discusses advantages, illustrates examples, includes table of principal types of cast iron and their characteristics.

PLANT SERVICE EQUIPMENT

21 ROLLER CHAINS — *Acme Chain Corp, 821 Main St, Holyoke, Mass.* 98-page catalog covers complete line of roller chains, sprockets, conveyor chain attachments, plus engineering formulas and installation data.

22 PARTS WASHER—*Michigan Tool Co, Gear-O-Mation Div, 7171 E McNichols Rd, Detroit 12, Mich.* Bulletin 574 presents information on a new high-level parts washer for parts that roll. Unit, designed for automated gear processing lines, is built to any applicable height, can process up to 950 parts per hr.

23 POWER APPLICATION FOR LIFT TRUCKS—*Towmotor Corp, 1226 E 152nd St, Cleveland 10, Ohio.* 12-page booklet SP-24 contains detailed information on the Towmostatic Drive, by which heel or toe pressure on pedal controls all horizontal movement of the truck, including creeping and inching, and provides pickup without jarring. Operational features explained, chief components illustrated and described.

24 BARREL FINISHING MEDIA — *BMT Manufacturing Corp, East 9th St, Elmira Heights, NY.* 4-page brochure illustrates and describes wide variety of Multi-Forms, a standardized size and shape media available in many different sizes and lengths for use with any type of barrel for finishing metals and plastics. Other media include Multi-Stars; compounds; loose abrasive grain; Nuggets; and Multi-Barrel slide-honing machines.

25 VIBRATORY LAPPING MACHINES—*Syntron Co, 811 Lexington Ave, Homer City, Penna.* Illustrated 4-page catalog section discusses method, provides descriptions, data, and specifications for five standard models with from 5 to 30-in.-dia lapping pans.

26 TUMBLING BARREL—*Wheelabrator Corp, Techline Div, 1140 Ave V, Vicksburg, Mich.* Bulletin provides information on the Liquamatte auxiliary barrel for wet blast equipment. Deburring and cleaning of small parts that can be tumbled can be accomplished automatically; barrel can be adapted to other wet blast machines.

27 CONTOUR SANDING HEAD — *Abrasive Machinery Corp, Dept L-257, 444 S Pennsylvania St, Indianapolis 25, Ind.* Literature illustrates and describes features of Smooth-O-Matic for use on metal or wood. Both aluminum oxide and silicon carbide grits can be used in all grades. Heads are available in stationary units or for portable hand tool applications. Ranging in abrasive widths from 2 to 50 in., they are particularly useful on automatic and automated machines in finishing of aluminum abrasions and other types of metals.

28 AIRLESS SPRAY COATING EQUIPMENT — *Nordson Corp, Amherst, Ohio.* 4-page illustrated brochure describes process for spraying enamels, lacquers, vinyls, adhesives, and other materials without use of atomizing air. Operational details and advantages discussed as well as features of equipment and accessories.

29 LIGHTING FIXTURES — *Stonco Electric Products Co, 333 Monroe Ave, Kenilworth, NJ.* 12-page catalog presents illustrated description of Vaportight line. Includes specifications, dimensional data and application information for all components and assemblies of the entire line of completely interchangeable pendant, ceiling, and wall fixtures.

30 CONVEYOR — *Rapids-Standard Co, 542 Rapistan Bldg, Grand Rapids 2, Mich.* Illustrated brochure gives details on Rapistan Model 1050 Table-Veyor. Includes applications, operational data, and lengths, widths, and working heights available.

31 SPRAY DECORATING EQUIPMENT—*Conforming Matrix Corp, 321 Toledo Factories Bldg, Toledo 2, Ohio.* Data file available covers equipment that includes electro-formed nickel and copper masks, mechanical and air-operated clamps and pressure fixtures, automatic mask washers, and automatic spray decorating machine.

32 400-CYCLE POWER PACKAGES—*Safety Industries, Inc, Electrical Div, PO Box 904, New Haven 4, Conn.* 6-page bulletin 307 gives facts on packages incorporating unit-mounted motor, inductor-alternator and controls. Includes construction data, operating information, dimensions and weights on output ratings from 1½ to 10-kw units. Equipment is designed to provide closely regulated 400-c power from a 60-c source.

33 MATERIALS HANDLING EQUIPMENT—*SI Handling Systems, Inc, PO Box 70, Easton, Penna.* 4-page data sheet 50 presents illustrated information on complete line of platform trucks, trailers,

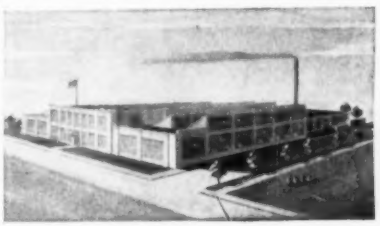
3 ways CDT can help you

CDT CAN INCREASE YOUR PRODUCTION
. . . because CDT specializes in designing and building tools and machines for today's high production demands.

CDT CAN IMPROVE YOUR QUALITY
. . . because CDT tools, jigs, fixtures and machines are precision engineered and built to the strictest requirements.

CDT CAN LOWER YOUR PRODUCTION COSTS
. . . by increasing the efficiency of your operation with special tools that do the job better—faster—more economically.

Call on Columbus Die-Tool for your special tooling problems. A large creative engineering staff with experience in developing special tools and machines for hundreds of industries is at your service. Over 50,000 square feet filled with precision production equipment enables us to build fine tools and special purpose machines to exacting requirements. Avail yourself of the industry-wide experience of Columbus Die-Tool.



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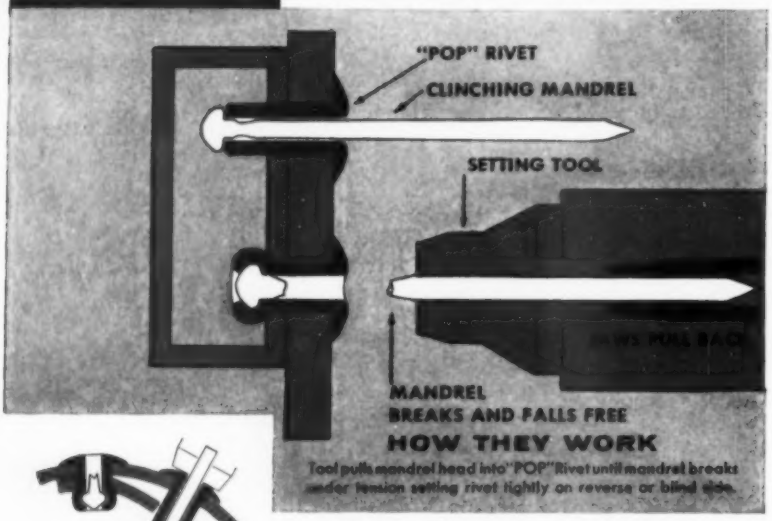
Columbus Die-Tool
AND MACHINE COMPANY
P.O. BOX 750 • COLUMBUS, OHIO
ESTABLISHED 1906

Designers and manufacturers of JIGS • FIXTURES • SPECIAL TOOLS • UNITS FOR MACHINE TOOLS • *also Builders of Machine Tools Complete*

5-Year Study Proves

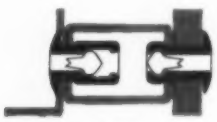
Each "POP" RIVET Saves 4.9¢ on Installed Costs



HOW THEY WORK

Tool pulls mandrel head into "POP" Rivet until mandrel breaks under tension setting rivet tightly on reverse or blind side.

High Clinching Action
Pulls parts together with up to 600 lbs. squeeze. Eliminates need to clamp.



Wide Grip Range
Simplifies inventory, purchasing, inspection. Same length "POP" Rivet holds tight through thick or thin.

Vibration Proof
"POP" Rivets cannot back out or become loose. Ensures tight assembly for years of use.

Least Back-Up Space
Strong, high strength "POP" Rivets need only enough back-up space to provide room for set head. Gives more compact design.

Saves 4.9¢ each over other blind rivets

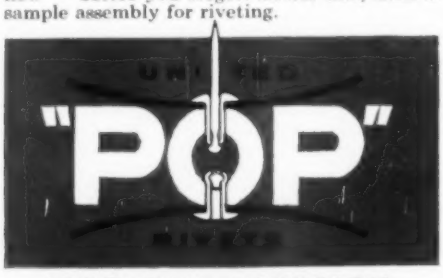
Saves 1.8¢ each over solid rivets

Replace 100,000 solid rivets with strong, high clinch "POP"® Rivets and you save $1,800. Use 100,000 time-tested "POP" Rivets for blind assembly work and you save $4,900.

No other rivet equals the savings potential in *installed costs* provided by "POP" Rivets. The Martin Company saved $223,000 on one fifty-plane contract alone — and with today's rapidly increasing costs, even greater savings are possible. In addition, the extraordinary design flexibility of these rivets gives engineers many opportunities for simplified product design.

Extreme light weight, high production gun — only 2 lb., 3 oz. sharply reduces operator fatigue. Means more rivets set per hour right on the assembly line — rates as high as 1200 per hour even with unskilled operators.

Whether you make planes, missiles, cars, trucks, trailers, metal awnings, furniture, boats, or toys, you can cut costs, simplify design and add assembly convenience with "POP" Rivets. Call or write for our literature now — before you forget. Better still, send a sample assembly for riveting.



"POP" RIVET DIVISION
UNITED SHOE MACHINERY CORPORATION
West Medway, Mass. • Phone: Keystone 3-6611

Free Literature

To order any of these bulletins, circle corresponding number inside back cover.

carts, skids, wheels, and barrel trucks. Includes data on features, design specifications, sizes, capacities, plus information on engineered systems available.

34 MOTOR-DRIVEN CRANES—*American Chain & Cable Co, Wright Hoist Div, York, Penna.* 8-page bulletin DH-445B pictures and describes Type B-514 top-running, single-bridge, motor-driven units in capacities from 1 to 10 tons with spans up to 50 ft and in standard bridge travel speeds of 75, 125, and 175 fpm. Models are designed for all floor-controlled applications. Includes specifications, weights, capacities, and dimensions.

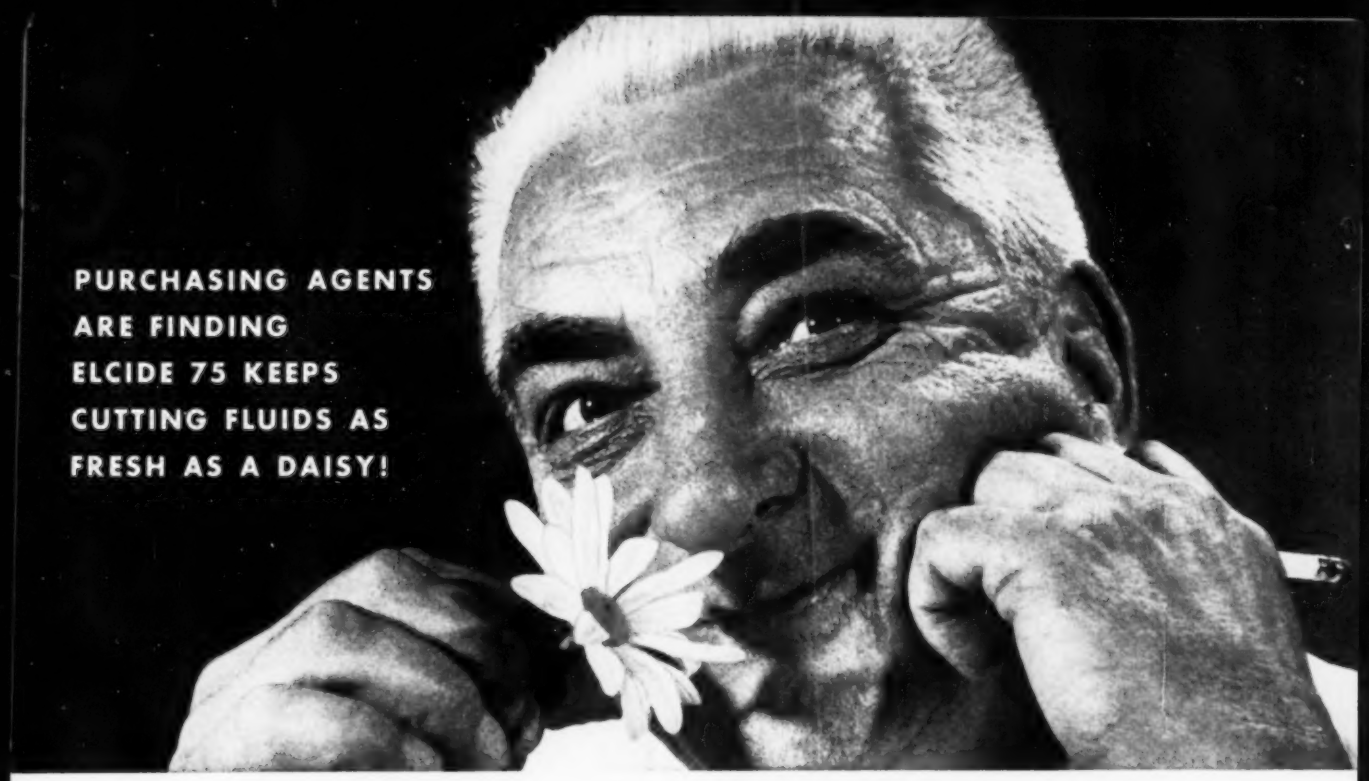
35 ANODES AND PLATING CHEMICALS — *Hanson-Van Winkle-Munning Co, Matawan, NJ.* 8-page bulletin AC-111 covers complete line of anodes, anode hooks, and anode bags, detailing composition, shapes, and applications. Specifications given for round, flat, elliptical, and specially shaped anodes, including nickel, cadmium, brass and bronze, copper, zinc, and lead.

PARTS AND MATERIALS

36 RUBBER-METAL PRODUCTS — *Clevite Harris Products Inc, Lockwood Rd, Milan, Ohio.* 12-page illustrated catalog presents information on products including bearings, bushings, couplings, mounts, sleeves and molded shapes. Characteristics of typical mechanically bonded and chemically bonded components are described. They are engineered to accept misalignment, isolate vibration, eliminate lubrication, and cushion shock loads in all types of service. Design information, including formulas for determining permissible radial, torsional, axial, and conical loadings for standard and projected parts is furnished.

37 CONDUCTOR SELECTOR CHART —*Aluminum Co of America, 1501 Alcoa Bldg, Pittsburgh 19, Penna.* Logarithmic slide rule aids in selecting dimensions of aluminum foil or sheet for use in strip-wound electrical coils. Rule provides means of converting from standard wire sizes in copper or aluminum to an equivalent aluminum strip conductor. Wire size is set on a reference scale, and a wide range of equivalent strip conductor size combinations of width and thickness is shown on a selector scale.

"What incentive plan do you use? Piecework, Taylor, Halsey, Bedaux, Rowan, Emerson, or Gantt?"



ELCIDE 75™ extends the life of soluble oil emulsions

. . . lowers operating costs three ways

Less oil concentrate is purchased because standard duty emulsions last far longer when treated with one ounce of Elcide 75 per four gallons of emulsion.

Labor costs are reduced because less non-productive time is spent recharging machinery. The labor costs of disposal also decrease because there is much less waste-oil to be handled.

Production increases because machines are not shut down as often. Elcide 75 also contributes to better products and longer machine tool life by controlling the bacteria that may cause staining and corrosion. Employee efficiency improves, too, because Elcide 75 eliminates odor and controls bacteria that can cause skin infections.

Elcide 75 is more effective than other inhibitors because it is a combination of antibacterial agents, and includes a powerful new compound related to one of the safest, most effective bacterial inhibitors used in medical surgery. This combination controls a wider range of bacteria, including certain types that were resistant to commonly used germicides.

Elcide 75 controls harmful bacteria . . .

This photomicrograph shows one type of bacteria that enter emulsions through the air, water, and plant debris. They multiply rapidly and cause odor, staining, corrosion, and emulsion breakdown. Their damage costs the metalworking industry thousands of dollars each year.

Elcide 75 specifications: *Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium o-phenylphenate. Price per gallon—1 gallon (4 per case), polyethylene, $8.50; 5 gals., polyethylene, $8.00; 55 gals., stainless steel, $6.50. Sold only through selected distributors. For more information or to place your order, phone or write:*

ELCIDE 75™

Lilly

Lilly's brand of bacterial inhibitor for cutting fluids

ELI LILLY AND COMPANY; AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA. TELEPHONE: MELROSE 6-2211

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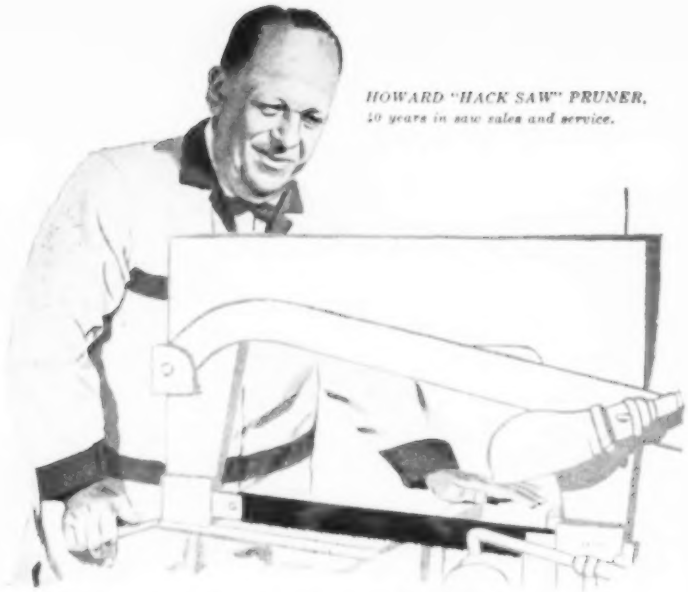

HOWARD "HACK SAW" PRUNER, 40 years in saw sales and service.

PRODUCTION SPEED AND ACCURATE CUTTING WITH

LENOX POWER HACK SAW BLADES

You can count on increased production with LENOX power blades featuring long-wearing teeth and straight cutting performance. LENOX power blades are heat treated and toughened under modern electronic controls to guarantee strong, uniform hardness. For a better blade . . . better made . . . you can always depend on LENOX.

OPERATIONAL STUDY? An experienced, technically-trained Lenox factory engineer is available to analyze your power hack saw operation . . . and possibly show you how to save time and money. Write or call today for immediate service. No obligation, of course.

HACKMASTER TYPE *High speed welded edge, shatterproof.*

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THE TOOLS OF THE RED BOX

AMERICAN SAW & MFG. COMPANY
SPRINGFIELD, MASSACHUSETTS • U.S.A.

Free Literature

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38 STAINLESS STEEL PRODUCTS AND SERVICES — *Committee of Stainless Steel Producers, American Iron and Steel Institute, 150 E 42nd St, New York 17, NY.* 159-page Buyers' Guide lists 3000 firms which make products or offer services pertaining to stainless steel. Contains 188 specific and general product categories followed by manufacturer's name and location. Product section also includes manufacturers of semi-fabricated forms including expanded, perforated, and textured. Book provides special table giving names and addresses of mill suppliers and the mill forms and shapes which they produce.

39 SERVO MOTORS—*Norden Div, Ketay Dept, United Aircraft Corp, Commack, Long Island, NY.* Bulletin 385A contains illustrated application data for standard and custom servo motors including schematics of units operating direct plate to plate, with transistorised amplifiers and with magnetic amplifiers. Characteristics and installation drawings are included in units from size 08 to size 23.

40 FASTENER - RECOGNITION — *Standard Pressed Steel Co, Box 875, Jenkintown, Penna.* 4-page bulletin (Form 2460) illustrates shapes of more than 70 different fasteners normally specified for aircraft, missile, engine, and related applications only by their national standard (NAS, AN, MS) designations, then identifies each with front-and-side-view sketches, and tells what type of fastener it is. Source of each fastener is listed and, in many instances, minimum tensile or shear strengths are cited.

41 HASTELLOY ALLOY C — *Haynes Stellite Co, Div of Union Carbide Corp, Kokomo, Ind.* 16-page booklet combines the latest data pertaining to this corrosion-resistant product under one cover. Chemical, physical, and mechanical properties, along with a guide to corrosion resistance, are presented through charts and graphs. Data on the high-temp properties of the alloy are also included.

42 ENCLOSED SWITCHES — *Micro Switch, Div of Minneapolis-Honeywell Regulator Co, Freeport, Ill.* 20-page catalog 83e covers complete line including nine housing groups of metal-enclosed units.

"Just what kind of work did you do on your last job?"

Q.

Are you drilling holes in your MONEY POCKET?

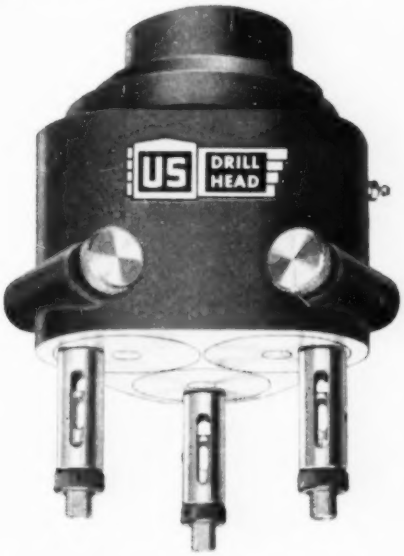
A.

NOT when you use *U. S. DRILL HEADS!*

That's because Adjustable U. S. Drill Heads are designed and built for profit-making performance!

Positive all-gear drive . . . Shaved gears for smooth, quiet operation . . . High factor of safety in design for greater reliability . . . Anti-friction bearing mounting of shafts and spindles for permanent alignment . . . Double Duty tools—when your drilling machine has a reversing spindle, you can drill and tap the same hole pattern with one head.

Write for Catalog AD-57. Or, send specifications of your requirements. No obligation, of course.



Standard Adjustable style is made in 5 models—58 sizes. A rugged head ideally suited for high production with flexibility.

US DRILL HEAD

Adjustable and Fixed Center Multiple Drilling Heads.
Individual Lead Screw Multiple Tapping Heads.

UNITED STATES DRILL HEAD CO.

BURNS STREET • CINCINNATI 4, OHIO

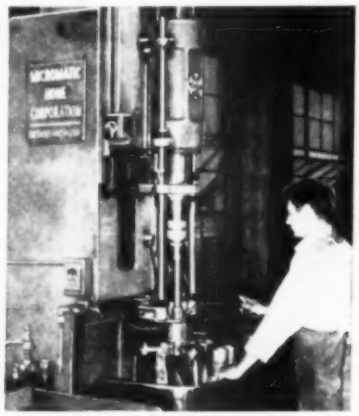
WHY MICROHONING*

OF GUIDE PIN BUSHINGS ASSURES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

Lamina Dies and Tools, Inc., a pioneer in the development of bronze-plated guide pin bushings (bronze is electroplated on hardened steel for combined strength and smoother action), required a processing method that would economically produce bushing bores having dimensional precision, accurate geometry, functional surface characteristics, and consistent duplication to exacting specifications in every bushing.

In developing processing methods for the bushing bores, Lamina engineers found that Microhoning is best for generating final precision and functional surface characteristics at lowest cost per bushing.

Bronze, bronze-plated or steel bushings from ¾" to 4½" in diameter are Microhoned on this Hydrohoner. Stock removal is from .001" to .003" and average unit cycle is 30 seconds. Machine is equipped with automatic size control and tool expansion.



Characteristic cross-hatch lay pattern

Why? Because Microhoning generates a round, straight cylinder along the neutral axis of the bore; size and geometry of bushings up to 2½" in diameter are held to .0001" tolerances; contact area between bushing and guide pin is 25% greater than obtainable by other final processing methods. In addition, the characteristic cross-hatch lay pattern generated by Microhoning provides a "built-in" lubrication system in each bushing bore. This combined with the clean-cut surface prevents seizure or scuffing during operation of bushing. Finally, the self-dressing action of Microhoning abrasives assures continuous cutting efficiency and identical geometry, dimensions and surface finish in every bushing bore.

Thus, Lamina realizes, through Microhoning's generation of quality surfaces and precision bores, the full performance potential of bronze, bronze-plated or steel guide pin bushings—longer life, smoother action, lower costs.

Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

*Registered U.S. Patent Office

MICROMATIC HONE CORP.

8100 SCHOOLCRAFT AVENUE • DETROIT 38, MICHIGAN

Free Literature

To order any of these bulletins, circle corresponding number inside back cover.

Among the 99 different listings shown are explosion-proof, maintained-contact, prewired, hand-operated, and sealed models.

43 INTEGRAL-SHAFT SHEAVES — *Allis-Chalmers, Milwaukee 1, Wis.* 6-page bulletin 20B7897B describes construction and operation features of Vari-Pitch sheaves for lowcost stepless speed control in large machines. Units provide wide range of speeds, infinite speed variations, and accurate speed control while drive is in motion. Design permits mounting the sheave between two pillow blocks for rigid support and provides flexibility to meet almost any drive requirement.

44 WROUGHT COPPER AND COPPER-BASE ALLOYS — *Western Brass Sales, Metals Div, Olin Mathieson Chemical Corp, East Alton, Ill.* 14-page booklet discusses properties, forms, and composition of these products. Lists nominal composition, available forms, tensile, yield, and shear strength, and elongation of alloys, both hard and soft. Ratings for corrosion resistance as well as the hot working and annealing range, and fabricating properties included.

45 PILLOW BLOCKS AND FLANGE BEARINGS—*Hoover Ball & Bearing Co, Ann Arbor, Mich.* 12-page bulletin 106 illustrates and describes self-aligning pillow blocks with eccentric locking collar, and diecast blocks for light duty applications. Includes detailed tabulated load rating data on SP pillow blocks, SF flanges, SBG and SB machine units.

46 PREVAILING TORQUE LOCKNUT — *National Machine Products Co, Utica, Mich.* 4-page brochure describes one-piece reusable Conelok nut. Complete engineering data and specifications included.

47 PHENOLIC MOLDING COMPOUND — *Hooker Chemical Corp, Durez Plastics Div, North Tonawanda, NY.* 6-page pamphlet D 203 describes Durez 16771 Natural, a high impact phenolic molding compound reinforced with Fiberglas. Produced in dry form, it consists of Fiberglas rovings ¼ and 1 in. in length impregnated with a Durez phenolic resin. Recommends appropriate molding equipment and mold design; advises as to pre-

"What's that dimension between the coffee stain and the place where you spilled the ketchup?"

forming, preheating, molding pressure and temperature, and cure time recommended for best results. Applications illustrated.

48 SILICONES — *Dow Corning Corp. Midland, Mich.* 16-page illustrated 1959 reference guide discusses nature, properties, and applications of wide range of silicones. Index covers uses from adhesives to water repellents.

49 CERAMIC TRANSDUCERS—*Gulton Industries, Inc. 218 Durham Ave, Metuchen, NJ.* 8-page technical brochure on new series of Glennite high-temp, piezoelectric units describes the exceptionally high Curie points of these transducers that have made it possible to reach higher output voltages per unit input pressure than can be reached with conventional ceramics. Applications discussed and illustrated.

50 WEAR-RESISTANT ALLOYS — *Haynes Stellite Co, Div of Union Carbide Corp, Kokomo, Ind.* 8-page booklet describes a group of five, investment-cast, wear-resistant alloys. These cobalt-base and iron-base alloys for extreme conditions of wear, abrasion, and heat, are available in shapes and forms sometimes impossible to make by other methods. Chemical, physical and mechanical properties are listed, along with data and recommendations on joining, machining, grinding, and heat treating.

51 TOOL STEELS—*Edgcomb Steel & Aluminum Corp, 480 Hillside Ave, Hillside, NJ.* Tooling products stock list classifies tool steels by standard AISI specifications rather than brand names. Technical and metallurgical assistance available for tool steel applications.

52 CHEMICALS — *Antara Chemicals, 435 Hudson St, New York 14, NY.* 64-page catalog describes composition, properties, and uses of Antara products. Separate sections cover surfactants, organic intermediates, acetylene derivatives, carbonyl iron powders, ethylene oxide and glycols, and number of specialty chemicals including optical brighteners, ultra-violet light absorbers.

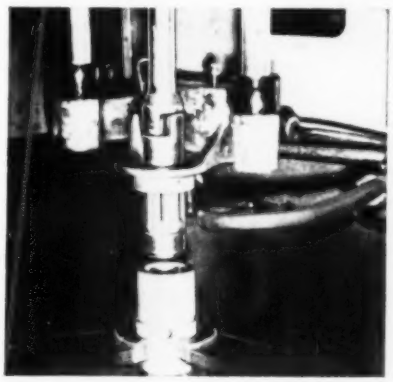
53 BLIND RIVETS—*Star Expansion Industries Co, Mountainville, NY.* 6-page illustrated catalog describes and gives specifications for line of Pin-Grip hammer-driven units for metal-to-metal and metal-to-wood fastenings. Total of 154 different sizes are listed in charts. Pin-Grips (aluminum) have SS drive pin with grip lengths in 1/16-in. increments.

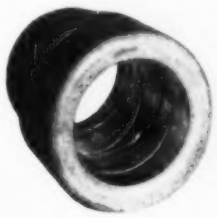
"Very well, but this is an automatic raise, and not for merit."

HOW MICROHONING* OF GUIDE PIN BUSHINGS PROVIDES FUNCTIONAL PRECISION, LONGER LIFE, LOWER COSTS

HERE'S HOW Lamina Dies and Tools, Inc. uses Microhoning to generate final precision and functional surface characteristics in bushing bores at minimum cost.

Microhoning's low-velocity, controlled abrading technique removes a minimum of the bronze plating to obtain accuracy and functional surface characteristics. Thus, as much as possible of bronze plating is conserved and a uniform thickness of bronze throughout the bore is assured.





Above is a typical Lamina guide pin bushing. These bushings range in diameter from 3/4" to 4 1/2". An air operated, three-jaw fixture rigidly holds the work piece and is easily adapted to bushings of any size.

Because Microhoning tools have universal joints, they follow the neutral axis of the bore in generating round, straight cylinders. Since the bore location remains unchanged, concentricity between bushing I.D. and O.D. is obtained.

The combined reciprocating and rotating motions of the Microhoning tool creates on the bore surface a cross-hatch lay pattern that functions as a "built-in" lubricating system. For, the multitude of minute, diamond-shaped plateaus—over which the load is evenly distributed—are separated by a network of valleys that holds the lubricant. This better method of lubrication plus the clean-cut Microhoned surface prevent seizure or scuffing of bronze, bronze-plated and steel bushings. And, the self-dressing action of Microhoning abrasives maintains cutting efficiency to assure the same surface finish is developed in every bushing bore.

Learn how Microhoning provides efficient stock removal, closer tolerances and functional surfaces—SEND FOR FREE LITERATURE.

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keep your eye on M.B.I.

for machine tools of the future!

DIXI 450 Optical Precision Rotary Table

TODAY... the most progressive products in the industry... TOMORROW, even greater achievements! M.B.I. is continuing to expand its outstanding line of machine tools and accessories in order to serve you better.

DIXI 60

horizontal optical jig borer

(Made in Switzerland—Measurements in Inches)

The only horizontal jig borer that combines the accuracy of the vertical spindle with the versatility of the horizontal spindle.

ACCURACY: Optical settings provide an overall accuracy of .0002".

VERSATILITY: The combination of the Dixi 60 and the Dixi 450 precision optical rotary table (illus.) permits jig-less boring, facing, milling and drilling work in all planes and compound angles between them with optica interrelationship all in one set-up.

PRODUCTIVITY: A complete optical setting, including unclamping, positioning, fine adjustment, reclamping and rechecking takes less than 10 seconds. Convenient and functional controls eliminate idle machine time.

The **DIXI** Optical Reversing Process assures perfect alignment in work pieces with line bores, as well as round, taper-free holes. Get all details on this process by writing for illustrated catalog.

MBI has engineers available for consultation, guarantees service by factory trained staff, and stocks spare parts in New York. Join the long list of leading aircraft and manufacturing plants throughout the United States which are using the Dixi 60.

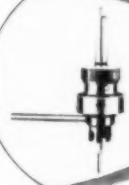
All tools shown here are tested for performance to American Standards.

Distributors inquiries invited.

Write for literature and detailed information to:

REVERSIBLE SAFETY TAPPING ATTACHMENTS

With adjustable graduated friction drive, hardened, ground and lapped. Precision made throughout.

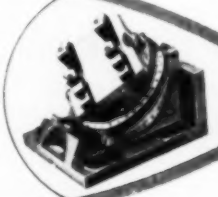


KEYLESS DRILL CHUCKS

CAPACITIES UP TO $\frac{5}{8}$".
ALL OPERATING PARTS HARDENED AND INTERCHANGEABLE.
SELF-TIGHTENING: tighten the easy-grip sleeve by hand and the tool is chucked. Drill does not slip since the gripping power of the chuck increases with the load. Chuck easily opened by hand despite tremendous gripping power.

MULTI-PURPOSE VISES

Horizontal and vertical swivel. 4 stepped jaws permit clamping of even rough castings, and irregularly shaped pieces accurately and quickly, eliminates special jigs or fixtures. Narrow jaws allow free access to and measuring of work pieces and provide clearance for cutting tools. Rigid in any position.



DIAL VERNIER CALIPERS

Eliminate costly reading errors. Dial indicator reads directly in .001".

5", 6", 8" and 10" capacities, in tool steel or stainless steel. Thumb roll permits quick and easy operation. Knurled lock screw. Beam and jaws fully hardened, ground and lapped.

M.B.I. EXPORT & IMPORT LTD. A DIVISION OF MACHINERY BUILDERS, INC.
475 Grand Concourse, Bronx 51, N. Y. *"Over 25 years' experience in designing and building machinery"*

Charles F Myers has been elected president of Van Norman Industries, Inc. Named executive vice president in November, Mr Myers was formerly president of the Morse Twist Drill & Machine Co, New Bedford, Mass, division of the corporation

Esmonde J Bushey has been promoted from assistant works manager to works manager of the Athol (Mass) Div of the Union Twist Drill Co. He succeeds **George W Grover Sr** who has retired after 39 years of service

George S Chiaramonte has been appointed sales manager of Sheffield Corp's Cogsdill Twist Drill and Threadwell Tap & Die Divisions in Greenfield, Mass. He was formerly sales manager of E Horton & Sons Co, later the Horton Div of United-Greenfield Corp

NAMES IN THE NEWS...

Franklin S Atwater, general works manager of Fafnir Bearing Co, New Britain, has been appointed vice president, manufacturing, to succeed **Richard F Cooper,** elected an administrative vice president. **Robert W Powell** has been promoted from general sales manager to vice president. sales, replacing **Charles F Stanley** who has retired.

D S Harder and **Ray H Sullivan** are retiring from Ford Motor Co Jan 31. Mr Harder, who joined Ford in 1946 as vice president, operations. was executive vice president, basic manufacturing divisions, from January 1955 until April 1958. Since that time he has served as vice president and technical adviser to the president and the chairman of the board. He will continue as a member of the board of directors. Mr Sullivan joined Ford in 1948 as assistant general manager of Rouge automotive manufacturing operations. He served as vice president with direction over all engine and metal stamping activities from 1950 until last April when he retired from direct line responsibilities to assist Mr Harder on special projects.

William H Roberts has been elected executive vice president of Detroit Stamping Co. He has been serving as vice president in charge of the Finished Products Division. **Harry C Robeson,** stampings sales manager, has been elected vice president in charge of sales of all products.

Wilmot F Wheeler Jr, vice president of American Chain & Cable Co, has been elected executive vice president and a director of the corporation. **Wilmot F Wheeler Sr,** active for more than 42 years with ACCO, has resigned as chairman of the board and as chairman of the executive committee.

Raymond W Smith and **Harold A Strickland Jr** have been elected vice presidents of General Electric Co. Mr Smith is general manager of the company's Transformer Division, Pittsfield, Mass; Mr Strickland is general manager of the Industrial Electronics Division, with headquarters

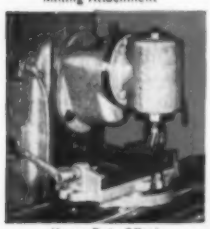
Donald L Price (left), sales manager of grinding wheels for the Abrasive Division of Norton Co, Worcester, Mass, has been elected a vice president of the company. **Wilfred R Ogg,** Chicago district manager of the Grinding Machine Division, has been made manager of distributor sales for the Division. He will also be in charge of export sales made through Norton Behr-Manning Overseas

R E Lenhard, executive vice president of Air Reduction Sales Co, the industrial gases and welding products division of Air Reduction Co Inc, has been named president of that division

From the *American Machinist* Library of *Tips for Top Shop Men*

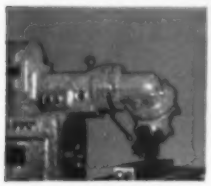
WHEN you walk the tight-rope between close tolerances, or between good and bad finish, balance is vital. Be sure you have it, in machine-tool spindle or shaft, in tooling, in fixture. It will pay out in longer tool life and reduced scrap.

Heavy Duty Vertical Milling Attachment



Heavy Duty Offset Vertical Milling Attachment

Universal Milling Attachment



Toolmakers Overarm

Heavy duty attachments increase versatility of dependable, low-cost

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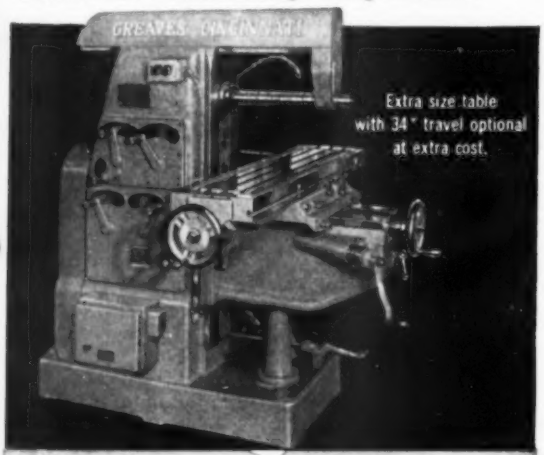
"THE MOST MILL FOR THE LEAST MONEY"

A full line of attachments and accessories offer outstanding flexibility for all types of milling operations . . . with GREAVES MILLS.
Make your own comparison of 22 specifications of Greaves and 7 other leading milling machines.



Send coupon for FREE Comparison Chart and detailed descriptive literature on easy-to-use attachments.

GREAVES MACHINE TOOL CO.
2100 Eastern Avenue, Cincinnati 2, Ohio

Send Comparison Chart. I will make my own comparison of GREAVES MILLS with other makes.
Send information on Attachments and Accessories for GREAVES MILLS.

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FIRM _____
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CITY _____ ZONE _____ STATE _____

NAMES IN THE NEWS...

in New York. **John T Castles** has been named manager of GE's Chemical Development Operation. Formerly manager of sales for the company's Silicone Products Dept at Waterford, NY, Mr Castles will have responsibility for conducting product and process development on new materials.

James H Sands, executive vice president of Eclipse Fuel Engineering Co, Rockford, Ill, has been named adviser to the Director of the Metalworking Equipment Division, Business and Defense Services Administration, US Dept of Commerce. He will serve for a period of six months

Sir Stanley J Harley, chairman and managing director of Coventry Gauge & Tool Co Ltd, has been appointed president of the Gauge and Tool Makers' Association of England.

Howard S Kaltenborn has been named vice president and assistant to the president of Westinghouse Electric Corp. Mr Kaltenborn was formerly vice president of Industrial Relations Counselors, Inc, New York. **Dr S W Herwald,** manager of the Westinghouse Air Arm Division at Baltimore, has been elected vice president, research, for the company.

George R Metzdorf has been appointed manufacturing vice president at Capitol Products Corp, Mechanicsburg, Penna. He was formerly director of manufacturing of the York Division of Borg-Warner Corp, York, Penna.

Frank M Ryan, vice president of Behr-Manning Overseas Inc, has been named vice president and general manager of this Norton Co division. **Fordyce B Scott,** formerly general manager of Behr-Manning de France,

Courtesy Combustion Engineering, Inc.

Combustion Engineering uses Gilberts for precision boring on atomic reactors

It takes an unusual boring mill (specifically, a Cincinnati Gilbert) to meet the specifications on this job:

(a) diameters within .001",

(b) parallelism of center line of holes to center line of plate within .0001" per inch,

(c) parallelism of flat surfaces within .010",

(d) 32 R.M.S. surface finishes.

These are some of the machining requirements on this part for a fast breeder reactor built in the Chattanooga plant of Combustion Engineering, Inc., pioneer manufacturer in the nuclear field. They are typical of the quality of work assigned to this Cincinnati Gilbert table type horizontal boring mill. Automatic positioning makes work-handling fast and precise.

A number of other Gilbert boring mills are producing similar close-tolerance work for Combustion Engineering—proof that "those who buy Gilbert buy Gilbert again."

New Bulletin 1157 will show you why Gilbert boring mills do so many things so well.

The Cincinnati Gilbert Machine Tool Co., 3340 Beekman Street, Cincinnati 23, Ohio.

those who buy **GILBERT** *buy Gilbert again*

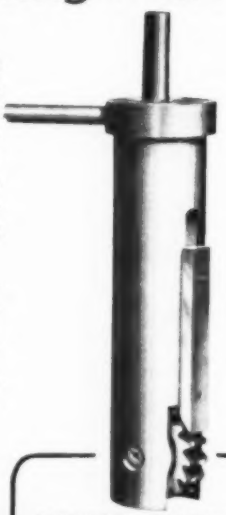
CIRCLE 259 READER SERVICE CARD

CIRCLE 260 READER SERVICE CARD

The INSIDE STORY about NATIONAL Keyseating Millers

NATIONAL Keyseating Millers are designed for milling internal keyseats . . . in one cut . . . in offset holes . . . with parallel sides . . . partly through holes . . . of standard width and depth . . . in holes that are closed at one end . . . and many other operations. A demountable guide on body of Miller enters keyseat being milled assuring straight keyseat in perfect alignment with the axis of the bore, thus making it unnecessary to clamp work to drill press table.

CUTTERS are made from high speed steel which are hardened to Rockwell specifications and accurately ground to size. Tops of teeth are staggered to break chips which reduces strain and wear on both cutter and driving pins. It will pay you to put National Keyseating Millers on the inside of your next keyseating job.



national
MACHINE TOOL CO.
CINCINNATI 22, OHIO

WRITE TODAY
for Catalog No. 17
complete, handy size

NAMES IN THE NEWS...

has returned to the company's main office at Worcester, Mass, as vice president in charge of sales of Behr-Manning tape and coated abrasive products. **Louis J Camarra**, former European regional manager, has returned to Worcester as vice president in charge of sales of Norton abrasive and refractory products.

Elmer F Twyman, a vice president of Yale & Towne Manufacturing Co, has been elected senior vice president. He directs the materials handling operations of the company

Robert F Schutz has been appointed executive vice president and manager of Borg-Warner Corp's Ingersoll-Kalamazoo Division. **Ben A Swennes** has been named vice president and director of engineeering, and **Anthony S Mrozek** vice president in charge of defense sales. **Gordon Turnbull** has been appointed vice president and works manager of the Marvel-Schebler Products Div. Decatur, Ill, and **Frank Pilling** is new vice president and general sales manager. **M R McLary** has been named vice president and manager of the Ingersoll Products Div, Chicago.

Donald R Hepler has joined Cooper Alloy Corp, Hillside, NJ, as vice president, manufacturing. He was formerly associated with ACF Industries, Inc, Buffalo, as operations manager.

G A Barris has been promoted from plant manager to general manager of the Stainless Processing Division of Wall Colmonoy Corp, Detroit.

William F Rogge, general manager of Aeroquip's Industrial Division, has been elected vice president of the company, headquartered in Jackson, Mich. **Edwin F Clark** has been promoted from manufacturing staff

Bill Lenkeit tells why his Jig Boring and Jig Grinding Room is "all-Moore"

This is another in a series featuring the views of owners of leading contract tool and die companies

by **WILLIAM LENKEIT**
President
Lenkeit Machine & Tool Co., Inc.
Farmingdale, L. I., N. Y.
Precision Tooling, Contract Jig Boring and Jig Grinding

"Like other modern contract plants where close-tolerance work is the rule, we have a special air-conditioned room housing our jig borers and jig grinders. In ours, the nameplate on every machine reads 'Moore.'

"We have always sought to obtain the best possible equipment for each type of operation. That is why our facilities list includes outstanding machines of Swiss and German manufacture, as well as fine American-made equipment. But when it came to jig boring and jig grinding, we found there was no equal to Moore machines for built-in accuracy, versatility and ruggedness.

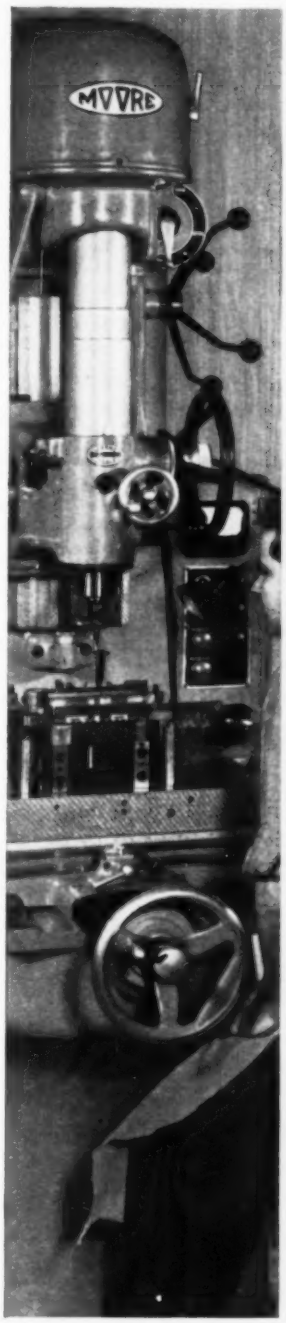
"We now have three Moore jig borers and one Moore jig grinder, with another borer on order. We use this equipment extensively for operations on the precision dies, jigs, fixtures and inspection gages we build for leading Eastern companies in the instrument, electronics, electrical and printed-circuits fields. We also do a considerable amount of contract jig boring and jig grinding for instrument companies which naturally have close-tolerance requirements.

"What do we like best about our Moore equipment? These machines are ideally suited to our day-to-day toolroom work—quick setups, convenient controls and, most important of all, unmatched accuracy. Our machines have been in almost constant use since they were installed and they are just as reliable as ever.

"Our all-Moore facilities for jig boring and jig grinding are a major reason why we can say: 'It pays to tool it right at Lenkeit'."

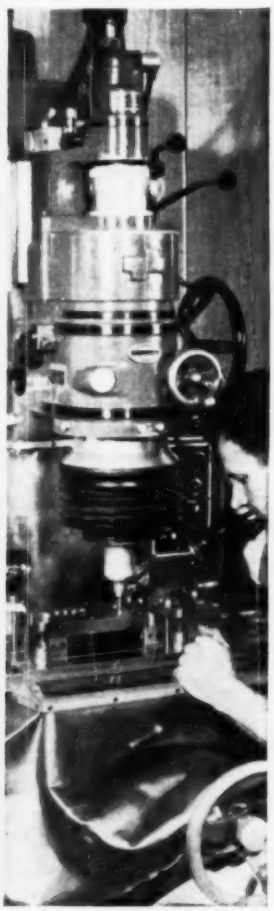
MOORE SPECIAL TOOL COMPANY, INC.
738 Union Avenue, Bridgeport 7, Connecticut

HOLES, CONTOURS AND SURFACES, Moore's authoritative book, tells how to produce tools, dies and precision parts the modern way. 424 pages, 495 illustrations. $5 in U.S.A., $6 elsewhere.



"One of the three Moore jig borers in our air-conditioned room. They carry the load on our critical spotting, boring, drilling, reaming and checking operations."

"Our Moore jig grinder is one of the key machines in our plant. We especially like its slot-grinding ability."



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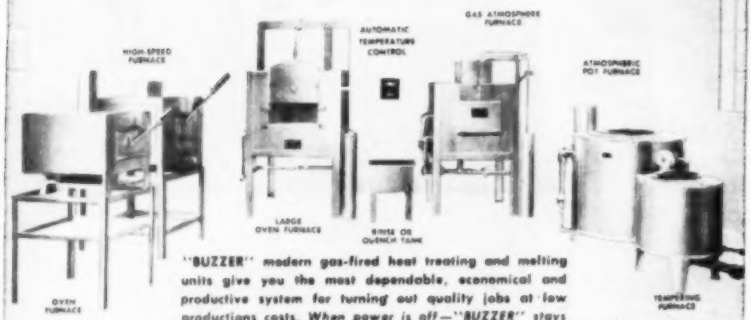
with BASIC "BUZZER PACKAGE"

NO BLOWER OR OTHER POWER NEEDED

. . . just connect to gas supply



"BUZZER" modern gas-fired heat treating and melting units give you the most dependable, economical and productive system for turning out quality jobs at low productions costs. When power is off—"BUZZER" stays on the job! Standard and special furnaces, large or small, available to equip your shop to exact requirements.

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Twenty-Station, Ten-Unit Transfer Machine for boring, counterboring, chamfering and valve clearance operations on V-8 automotive engine blocks. (Shown)

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REPRESENTATIVES IN PRINCIPAL CITIES

NAMES IN THE NEWS...

assistant to manufacturing manager of Aeroquip's Marman Division, Los Angeles. **Robert W Cooper,** formerly of Rohr Aircraft Co, has been appointed chief production engineer.

Bruce H Schwarze, director of engineering at the AC Spark Plug Division of General Motors in Milwaukee, has been named director of the Commercial Engineering Dept. one of four new engineering departments recently established in the division. Additional appointments: **Donald F Ayres,** chief engineer of navigation and guidance, to director of the Gyro, Components, and Engineering Services Dept; **Dr Joseph F Shea,** formerly with Bell Telephone Laboratories, to director of the Advanced Systems Engineering and Research Dept; **Dr James H Bell,** engineering program director for the Mace and Regulus guidance systems, to director of the Guidance and Navigation Dept. **Robert G Brown,** engineering program director for the Thor guidance system, has been named associate director of Guidance and Navigation.

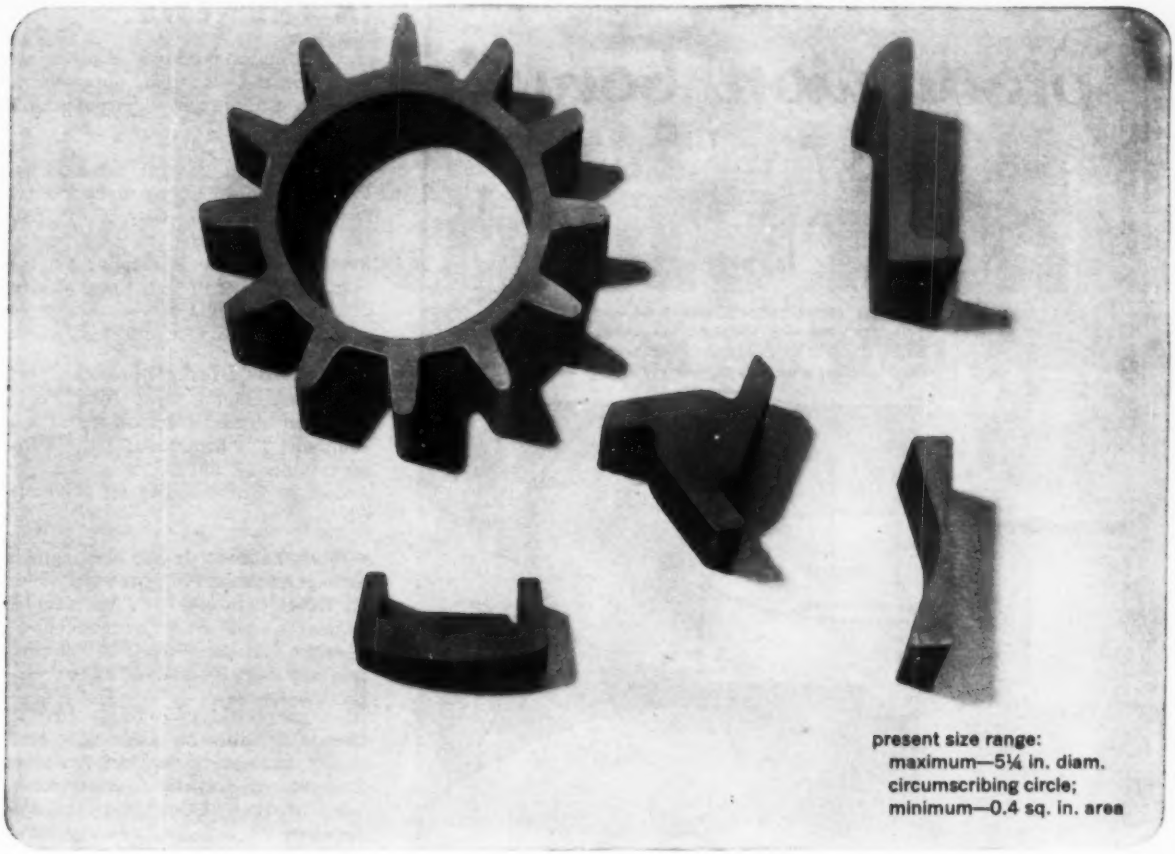
J H Carmichael, executive vice president of Fairchild Engine & Airplane Corp, Hagerstown, Md, has been named president. He replaces **Richard S Boutelle,** now vice chairman of the board.

Eugene Caldwell, general manager of Baker Industrial Trucks, a division of Otis Elevator Co, has been elected president of the Material Handling Institute, Inc. **C L Fell,** vice president, marketing, of American MonoRail Co, has been named first vice president, and **Robert F Moody,** sales manager of Hyster Co's Industrial Truck Division, second vice president of the Association.

Harry E Gravlin Jr has joined Hamilton Standard, division of United Aircraft Corp, Windsor Locks, Conn, as production manager. Previously he was associated with Chrysler Corp as manager of manufacturing services for the Parts and Equipment Division, Highland Park.

Russell S Kenerson has been elected president of Thompson Products, Ltd, succeeding **George A Stauffer,** named board chairman. Mr Kenerson was formerly vice president, operations. The company, a subsidiary of Thompson Ramo Wooldridge Inc, operates plants at St Catharines, Ont.

Experience**—the added alloy in **A-L Stainless, Electrical and Tool Steels



present size range:
maximum—5¼ in. diam. circumscribing circle;
minimum—0.4 sq. in. area

- 316 Stainless
- 304 Stainless
- Tool Steel Atlas 93
- SAE 4130
- 410 Stainless

Why hog out intricate shapes like these? Let A-L extrude them in any steel

If you're hogging out sections, paying for special mill rolls on small orders, or waiting for minimum rolling mill tonnages, Allegheny Ludlum Steel Extrusions are your answer. They will save you scrap loss, slash your machining costs, hold down your inventory requirements and cut delivery time.

Extruded shapes save money on expensive materials and on costly machining. Non-ferrous applications in the last decade have proven it. Now even greater savings are possible with tough, strong metals in Allegheny Ludlum Steel Extrusions.

Intricate extruded shapes in all stainless grades, tool steels, carbon steels, electrical steels, high temperature alloys, even zirconium and nickel alloys are now in production at Allegheny Ludlum, cutting costs in many different industries.

Costs and minimum order quantities are surprisingly low. Charge for die design is under $200. Orders taken for as little as 40 pounds.

To learn more about the time and cost-cutting possibilities of Allegheny Ludlum Hot Steel Extrusions, send for the extrusion booklet—12-pages of design and engineering information with process and product explanation, material properties, design tips and limitations, tolerances, order instructions, etc. Or call any A-L office for technical assistance. ***Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*** Address Dept. AM-131.

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for warehouse delivery of Allegheny Stainless, call RYERSON

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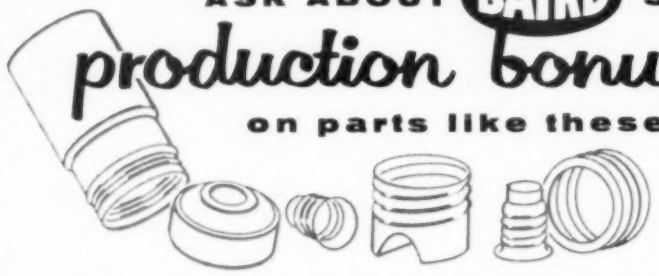
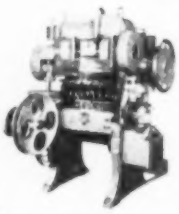
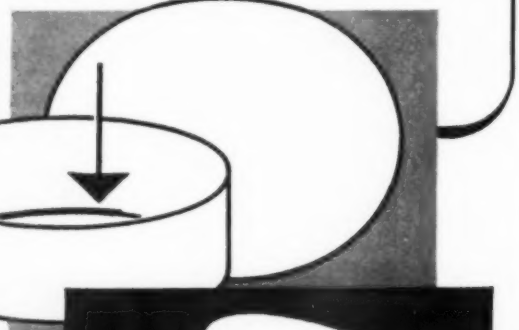
EVERY FORM OF STAINLESS . . . EVERY HELP IN USING IT

ASK ABOUT BAIRD'S
production bonus
on parts like these





The Baird "PRODUCTION BONUS" is the worthwhile sum of TIME, TOOLING and MATERIAL cost-savings effected by BAIRD MULTIPLE TRANSFER PRESS features NOT found in other machines or methods producing 150 pieces per minute.



for example

BLANKING and CUPPING for this electric lamp screw base are done at the blanking station on the same press that completes the part.

NO SECONDARY OPERATIONS required for side-piercing (back and front).

THREAD-ROLLING—again on the same press—completes this part. Thread-rolling attachment is cycled to the press speed.

From strip to finished screw base on ONE machine with ONE basic tooling, at a production rate of 150 pieces per minute!

Ask Baird about this unique high-production method . . . adaptable to a wide range of bases, ferrules, and other small drawn parts requiring multiple operations. Write Dept. AM.

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Six and Eight-Spindle Chuckers • Automatic Multiple Transfer Presses • Automatic 12-Station Duplex Turning Machines • Vertical Continuous Lathes • Automatic Four-Slide Machines • Pneudromatic Ribbon Metal Forming Machines • Barrel Finishing Machinery • Machinery for Chain and Roller Chain Production, Garment Hook and Eye Production • Precision Lunch Presses

8BA18

NAMES IN THE NEWS...

and is a major producer of precision parts for the Canadian automotive, aircraft, mining, and electronic markets.

Paul F Smith, general manager of Parker-Hannifin Corp's Parker Seal Division at Culver City, Calif, has been named president of the division. **Scott A Rogers**, assistant general manager, moves up to the post of vice president; and **T J McCuistion,** sales manager, is new vice president, sales.

Clayton D Grover, president of Whitehead Metals, Inc, New York, has been elected chief officer of the company. The firm, an affiliate of International Nickel Co, was formerly known as Whitehead Metal Products Co.

William Eismann Jr has been named manager, national lubrication sales, for E F Houghton & Co, Philadelphia. Formerly assistant to the manager of research, he succeeds **C R Schmitt,** recently named assistant to the vice president, sales.

Donald R Miller has been appointed works manager of the W-S Stainless Steel Works, Forge and Fittings Division, of H K Porter Co. He was formerly production manager of Curtiss Wright Corp's Curon Division, Quehanna, Penna.

H F Osterman has been appointed sales manager for Branson Ultrasonic Corp, Stamford, Conn. He was previously a research engineer for Jones & Laughlin Steel Corp. **John E Bobbin** has been named sales manager for Branson Instruments, Inc, subsidiary. He was formerly associated with Sperry Products, Inc.

OBITUARIES

Charles S Redding, 75, chairman of the board and former president of Leeds & Northrup Co, Philadelphia, died Jan 2. Mr Redding had been associated with the organization since 1901.

Frank W Albro, 59, master mechanic in charge of transmission factories at Buick, died Dec 23. Mr Albro, associated with Buick since 1918, was the creator of the automatic gear lines now used by automobile companies throughout the country.

Ruben O Peterson, 59, vice president, engineering, of the Brush Division of Osborn Manufacturing Co, Cleveland, died Dec. 28.

NEW BOOKS...

FOUNDRY NOISE MANUAL—*Published by the American Foundrymen's Society, Golf & Wolf Roads, Des Plaines, Ill. 50 pages. Size 8½ x 11½ in. Price. $4.75 ($3.00 to Society members).*

There are few books that can be recommended to every metalworking company, but this is one of those few. It deals with industrial noise, not exclusively from a foundry viewpoint, but in regard to what noise is, what causes it, how it is measured, what hearing loss is, how that can be measured, and the legal problems that result from hearing losses.

The book is short and direct, and it covers noise and its results from all aspects. There is considerable technical information about noise levels, hearing loss, and measurements; but even a casual industrial reader can get a considerable amount of general information without going into extreme detail.

The book includes good illustrations, including a large number of charts and graphs, plus a glossary of terms that apply to noise. Photos are somewhat slanted toward foundry applications, but most of the theory and technical data is general and applies to any metalworking installation.

•

ENGINEERING MATERIALS HANDBOOK—*Charles L Mantell, editor. Published by the McGraw-Hill Book Co, 330 West 42nd St, New York 36, NY. 1936 pages. Price, $21.50*

Engineering materials are tied in very closely to specifications, tests, standards, and the like in this new and completely up to date *Engineering Materials Handbook*. A comprehensive and authoritative reference, it considers materials from the viewpoint of engineering structures, machinery, and equipment. Gathered together in this one volume is the kind of information required by anyone concerned with planning design structure, manufacturing and serviceability.

In 43 carefully organized sections, the handbook covers metals, the organic and inorganic materials, and the cause and prevention of failure in materials. Technical tables, design information, structural characteristics, and tabular data make a wealth of useful and specific facts quickly available. A high degree of reliability is achieved by coordinating the work of more than 150 con-

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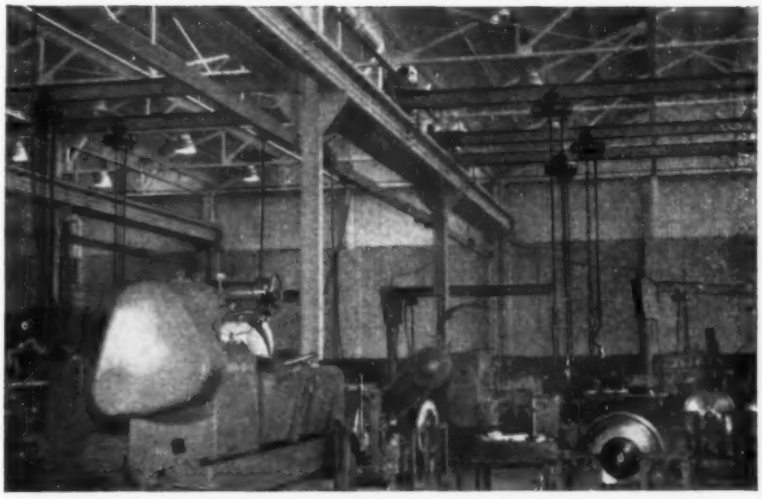
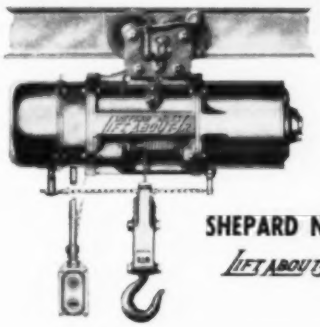
LIFTABOUT-JR.

EASES WORK

. . . on your production line





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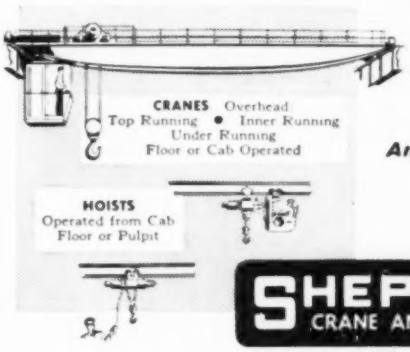
. . . with a Shepard Niles Liftabout-Jr. This husky, light-service hoist does all your back-breaking lifting . . . enables one man or woman to move more material at lower cost.

Low in cost, the Liftabout-Jr. features dependable wire rope hoisting. Available in 250, 500, 1000 or 2000 lb. capacities . . . parallel or cross-mounted with bolt, hook or trolley suspension.

SHEPARD NILES LIFTABOUT-JR.



• Write for latest Liftabout-Jr. Bulletin . . . and ask to have a Shepard Niles representative call.

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IMMEDIATELY AVAILABLE today from local Distributors all over America are many hundreds of sizes of bearings and bars made of the newest bearing metals that science has developed to cut cost, improve performance, and extend the life of moving mechanisms.

...ask or write for your copy of...

Catalog No. 58 Listing —
866 stock sizes of Bunting Cast Bronze Standard Bearings.
667 stock sizes of Bunting Sintered oil-filled Bronze Plain, Flange and Thrust Bearings. Made to ASTM Standards.
267 stock sizes of Bunting Cast Bronze Tubular and Solid 13" Bars.
84 stock sizes of Bunting Sintered oil-filled Bronze Tubular and Solid 6½" Bars.

Catalog No. 258 Listing —
343 sizes of Electric Motor Bearings for all makes and sizes of electric motors from 1/50 to 100 HP.

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Emergency machine shop service is maintained in all Bunting Branches for quick alteration of stock items for emergency maintenance applications.

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Your Bunting distributor is listed in the classified section of your telephone directory usually under Bars — Bronze, and Bearings — Bronze.

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Unmatched engineering and manufacturing and research facilities for special bearings and parts of Cast Bronze and Powdered Sintered Metals. Write for your copy of Bunting's "Engineering Handbook of Powder Metallurgy".

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Emphasis is placed on the fabricated forms of materials, their physical and mechanical properties, their adaptations, advantages, limitations, competition with each other, protection against deterioration, and increase in their stability to withstand use and abuse.

•

AIDS TO WORKSHOP PRACTICE — *By C T Bower A.M.I. Prod E, Printed in England and distributed by The Macmillan Co, 60 Fifth Ave, New York 11. 190 pages, 5½ x 8½. Cloth bound. Price $3.75.*

Over 260 workshop ideas and hints for the shop man, many of which are excerpts from four British metalworking magazines, are contained in this book. All items are briefly but distinctly described; most are accompanied by clear line drawings and photos.

In addition to many categorized items ranging from machining to assembly, hints are also to be found on such subjects as electrical repairs around the shop, lubrication, painting, and tool care. Though this book should be of greatest value to mechanics at the bench and maintenance men, the do-it-yourself fan may find it a good source of ideas.

•

SALES COMPENSATION MANUAL — *A Guide for the Capital Goods Industries. Published by Machinery and Allied Products Institute and Council for Technological Advancement, 1200 Eighteenth St, NW, Washington 6, D C. 239 pages. Price $15 to members, $20 to non-members.*

This comprehensive volume is designed to provide the same basic approach to compensation problems that MAPI's "Business Investment Policy" does to replacement problems. Although few of our readers are directly concerned with sales compensation, the book is such an excellent approach to the problem that we mention it for the benefit of those few who are interested.

The first half of the volume establishes and discusses in detail the basic provisions required of a sales compensation plan. The second half contains abstracts of actual plans used in the capital goods industries.

The entire job is the sound, well-organized study you would expect of MAPI.

The BAKER BASIC approach to production flexibility and retooling economy

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interchangeable heads . . . and tables

BAKER BASIC STANDARD VERTICAL MACHINES AVAILABLE IN 12", 18", 24" WAY WIDTHS

* The same selection of fixed and adjustable spindle heads can also be used interchangeably with BAKER HORIZONTAL models in 12", 18" and 24" way widths. For the complete, illustrated story of BAKER VERTICAL AND HORIZONTAL HYDRAULIC DRILLING AND TAPPING MACHINES, write for new free catalogs. BAKER BROTHERS, INC., DEPT. AM-159, TOLEDO 10, OHIO.

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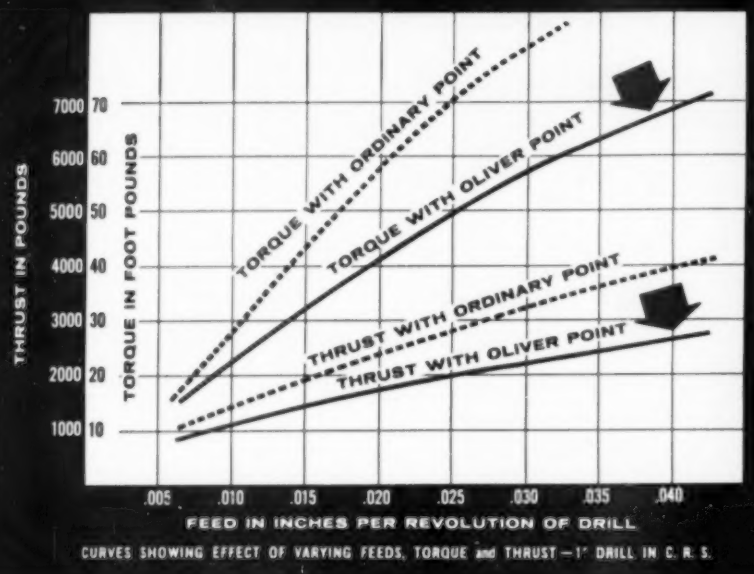

CURVES SHOWING EFFECT OF VARYING FEEDS, TORQUE and THRUST—1" DRILL IN C. R. S.

OLIVER'S UNIQUE DRILL POINTER gives you more holes per grind

Substantially less torque—much less thrust!

The above graph is a typical test run by the research department of an eastern engineering school. It is evidence that Oliver can help you get more and better holes per grind.

Oliver's sharpening principle is to grind the drill point so that increased clearance is obtained at the center of the drill. Each lip does its equal share and the theoretically perfect point permits easier penetration. Less feeding pressure means savings on drilling machine repairs, power and transmission costs and the drills themselves. *The Oliver point has been successfully used since 1921.*

Oliver drill pointers are rugged enough to stand up to every day pounding. Features of the Model #510 include: a universal chucking head which holds drills from ¼ to 3 inches in diameter and swivels to give varying angles from 82 to 160°; an adjustable cam to give a variable amount of clearance at the cutting edge; and a positive drive to the chuck. In addition, all main shafts—including the grinding wheel spindle—are mounted on anti-friction bearings.

Want proof? Oliver will sharpen *your* drills on a "no-charge" trial basis. Write today for full information. We'd like the opportunity of sending a quotation.

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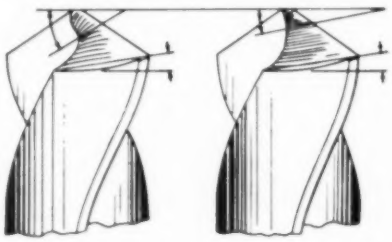
HOW TO REDUCE YOUR TWIST DRILL COSTS

Any substantial reduction in drill costs must be made by choosing a combination of the right drill design *and drill point*. As specialists in the manufacture of tool and cutter grinding machinery we are able to offer drill pointing machines designed expressly for cost reduction.

It is a widely accepted fact that for a given feed the angle of helix of the feed is greater as it approaches the center. The Oliver pointers provide average thrust reductions of 25.2% and average torque reductions of 22.0%.

The Oliver makes possible the trouble free grinding of drills—whether 2, 3 or 4 flute. Variable included point angles and clearances are easily obtained.

This cost-saving point is also available by using the new heavy-duty #21 bench model machine. Capacity is 3/32" to ½". A 5" diameter cup wheel and a built-in diamond dresser provides for easy operation regardless of drill size or included angle.



The sketch above shows a comparison of two drill points. The one on the right is as ordinarily ground. On the left is an exaggerated view of an Oliver drill point. Note that the clearance angle on the point increases very rapidly as the drill web is approached.

This man is tabling downtime indefinitely with SKF's new steel pillow blocks

He's cutting bearing maintenance to a minimum yet drastically reducing the chances of table downtime! For he's equipping the mill tables with SKF's new SMT Steel Pillow Blocks with self-aligning spherical roller bearings.

The split construction design of these new pillow blocks makes it possible for rolls to be removed without disturbing base alignment. The non-rubbing, labyrinth-type seal effectively keeps out scale and water and is not affected by high temperatures.

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He'll save with direct, center lubrication, too . . . because a lubricating groove is provided around the circumference of the outer ring of SKF sphericals with equally spaced holes drilled in the ring connecting the groove to the center of the bearing. Grease moves around the groove and through the holes which channel it directly to the center of the bearing.

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PRECISION PLUS. Now you can buy this lightweight tooling metal with closer flatness tolerances than ever before. With new production methods Dow magnesium tooling plate is now manufactured to these tolerances:

	In any one foot		In any 6 feet	
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0.250"-1.000"	0.005	0.003	0.015	0.007
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COSTS NO MORE. This big improvement in quality and value costs you not one penny more! Dow magnesium tooling plate STILL costs less than other lightweight tooling metals. You save money twice—once when you buy it and again when you use it.

Magnesium tooling plate is low in cost because it is rolled (not machined) to a flatness satisfactory for virtually all tooling purposes.

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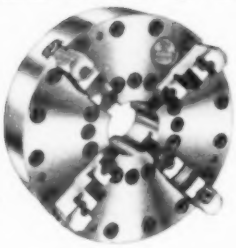
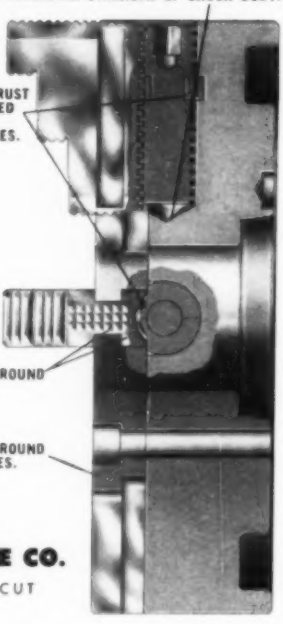
Whiton HARDENED PLATE CHUCKS for High Precision Work



In high-precision, low-cost turning operations the **right** chuck for the lathe and the job is of utmost importance. Whiton's Independent 4-jaw chuck — with more than 100 years experience behind it — features jaw slots formed by separate plates hardened and finish ground **before** mounting on the chuck body.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FULL CIRCLE THRUST BEARING RETAINED IN BODY BY SEGMENTAL PLATES.
HARDENED AND GROUND JAW SLOTS.
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The **Right** Chuck for the job is a Whiton! Whiton hardened plate type chucks available from 8" to 18" diameter for American Standard Spindle Noses: Types A, D, & L. Furnished with style No. 6 American Standard Tongue and groove or solid type reversible jaws.

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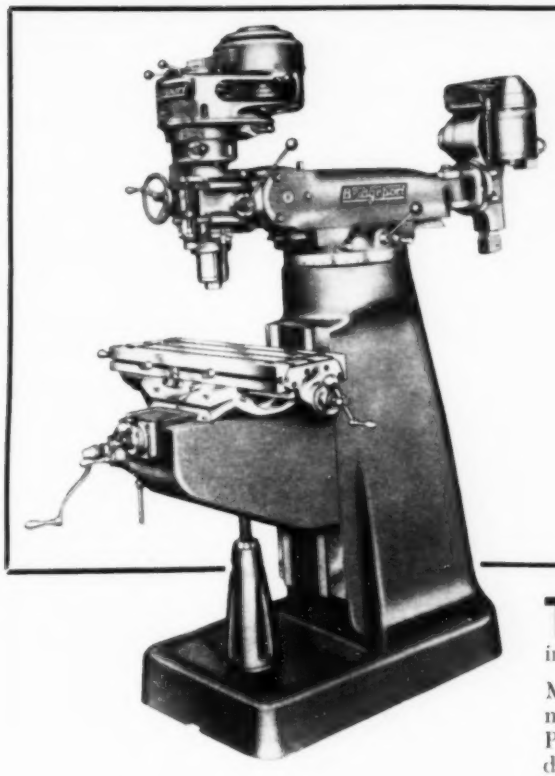
From the *American Machinist* Library of *Tips for Top Shop Men*

BE sure your machine tools don't spend most of their "working" day as layout tables. A machine tool earns its keep only when it is cutting metal. Jobs can be set up on a surface plate or bench by someone else—frequently someone better at setup than the machine operator.



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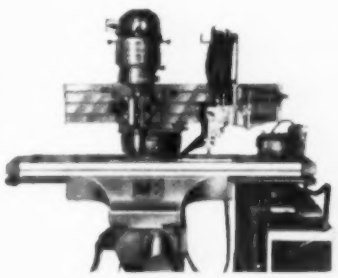

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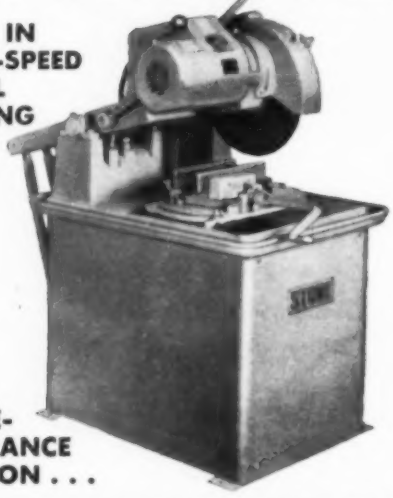

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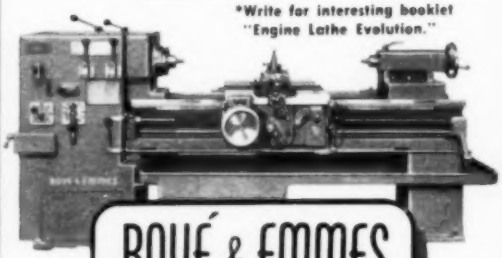

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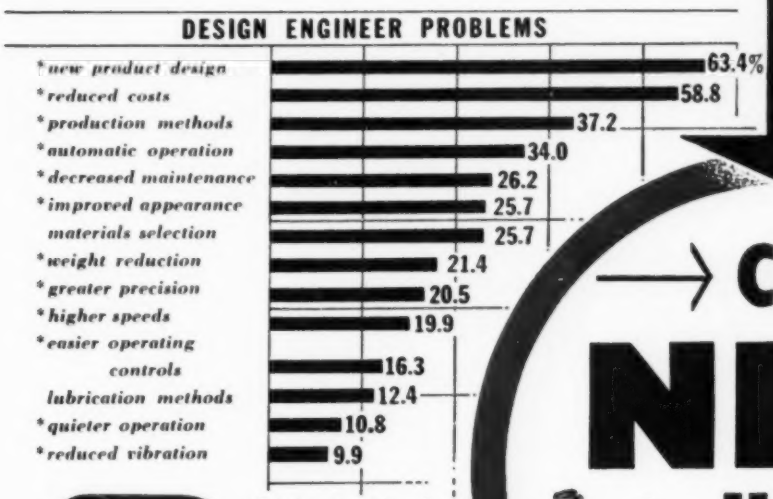
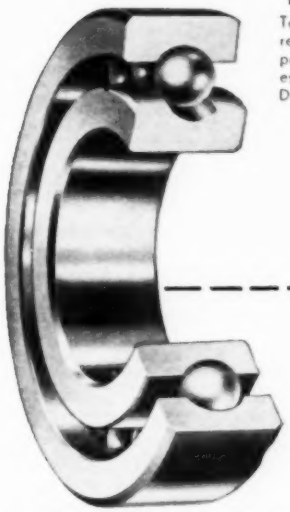
BEARING SELECTION IS AN IMPORTANT FACTOR...

in 12 Out of 14 Design Engineering Problems...



Tabulated results of a recent survey showing the problems receiving greatest attention from Product Designers.

→ Can NICE Help YOU?



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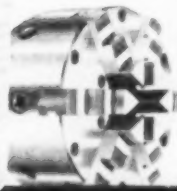

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Call in your Kennametal Carbide Engineer today to help you get the best tooling for every machine and material . . . applying Kennametal and helping to solve tough machining problems is his *full-time* job. Or write KENNAMETAL INC., Latrobe, Pennsylvania.

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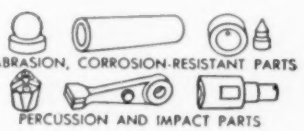

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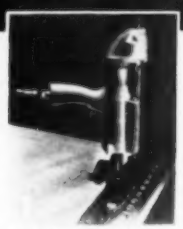

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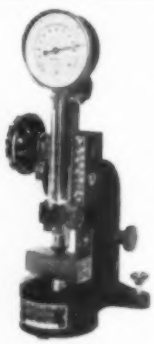

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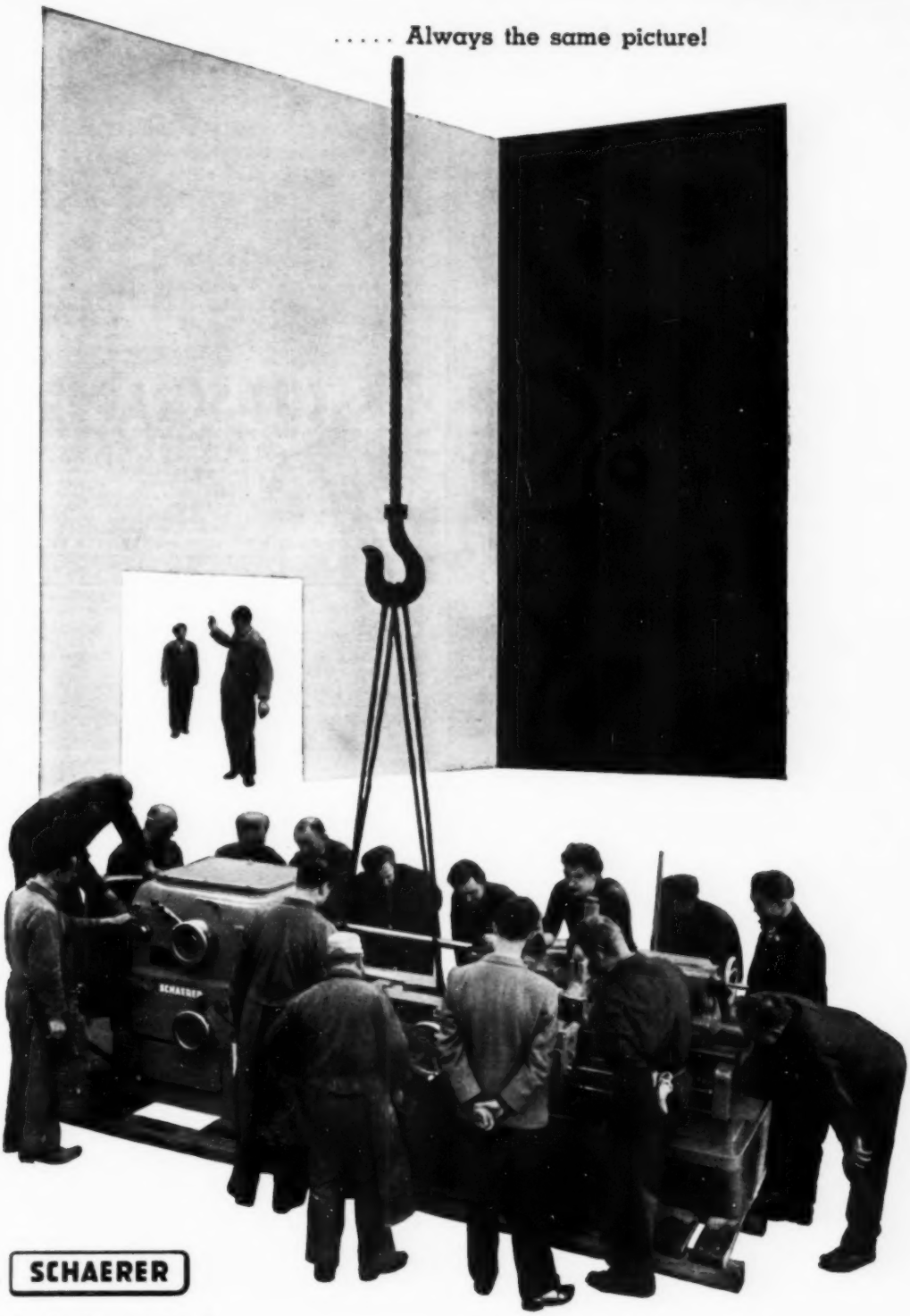

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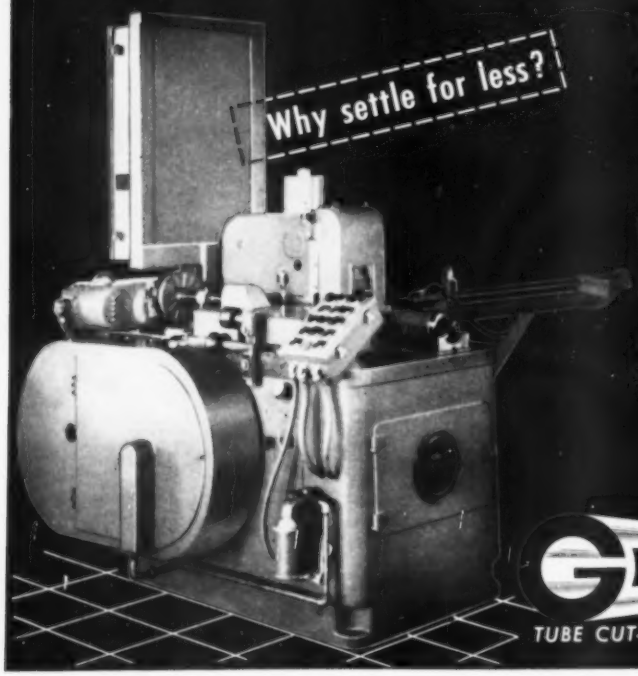

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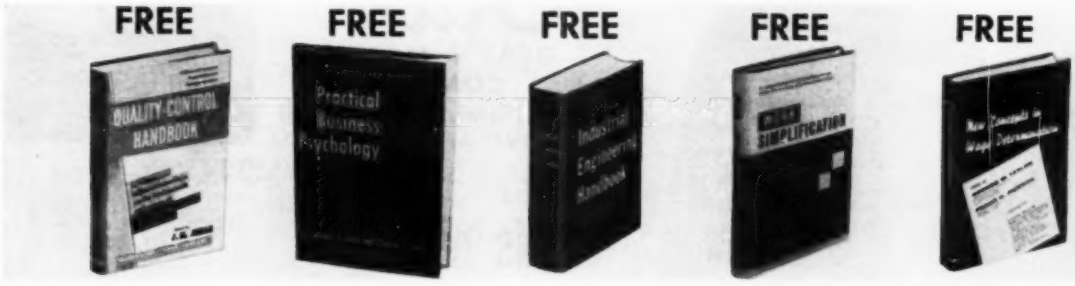

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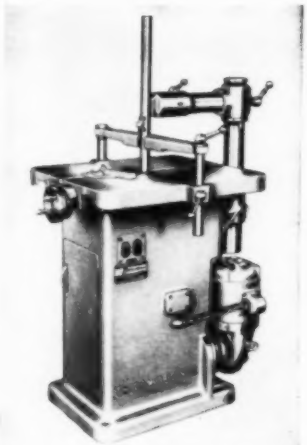

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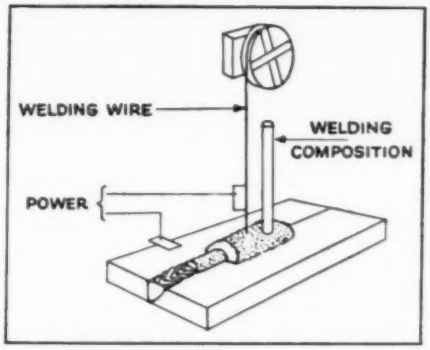

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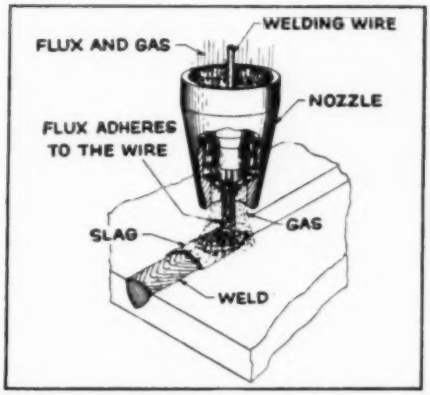

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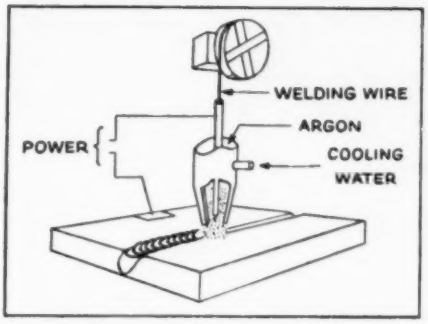

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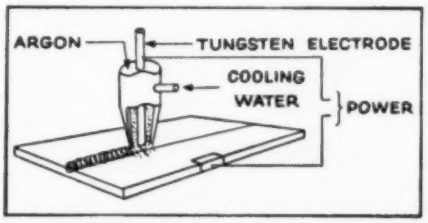

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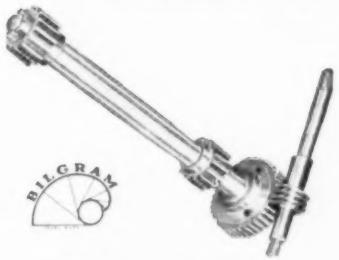

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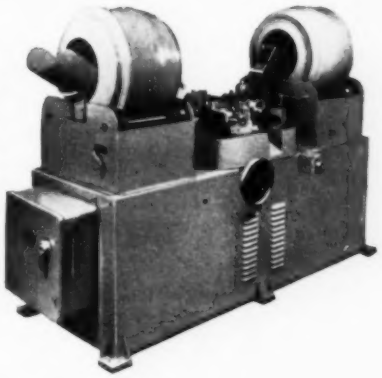

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